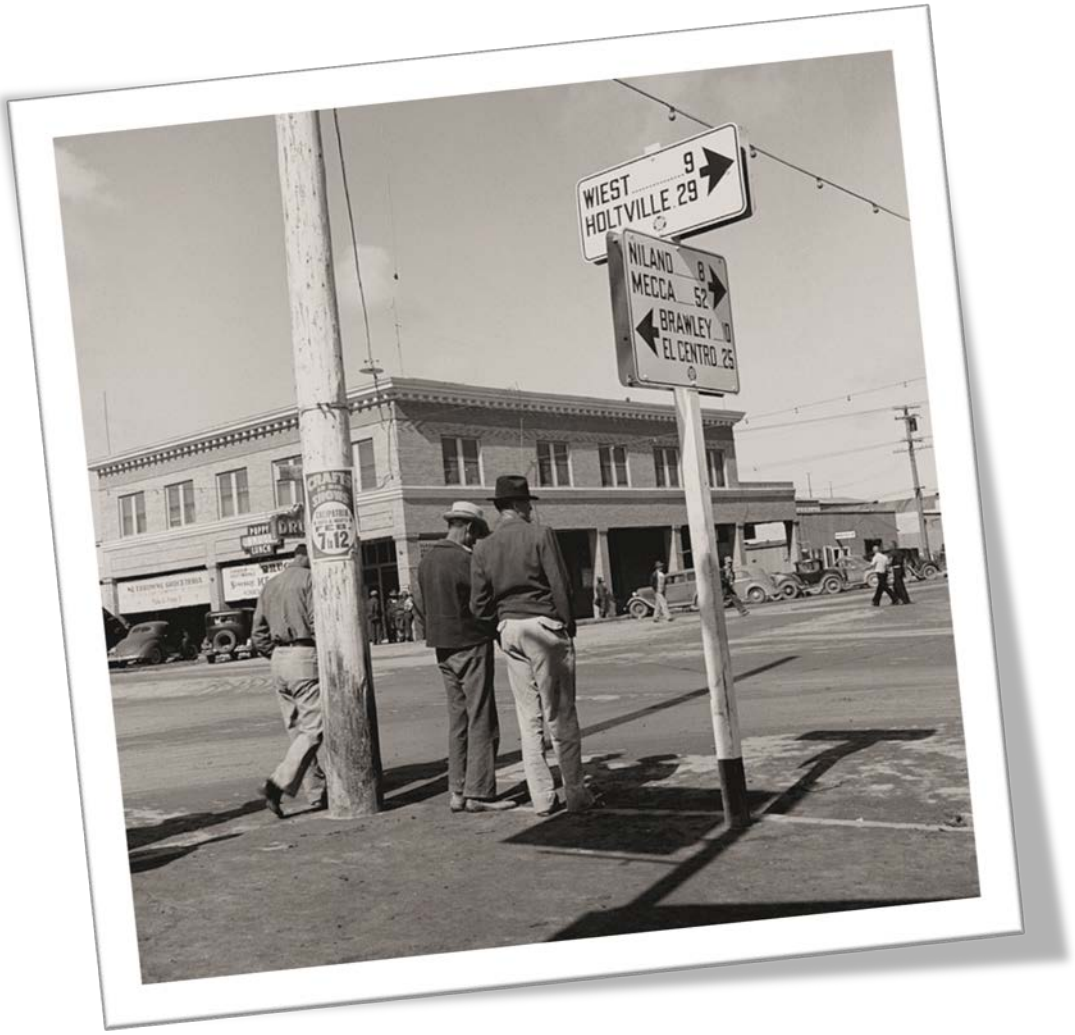
IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT



The History Place by Dorothea Lange: http://www.historyplace.com/unitedstates/lange/dor12-134.htm

November 25, 2015
Exceptional Event Documentation
For the Imperial County PM_{10} Nonattainment Area

FINAL REPORT

October 5, 2015

TABLE OF CONTENTS

SECTION PAGE

LIST OF FIGURES

FIGURE **PAGE**

LIST OF TABLES

TABLE PAGE

ACRONYM	DESCRIPTIONS
AOD	Aerosol Optical Depth
AQI	Air Quality Index
AQS	Air Quality System
BACM	Best Available Control Measures
BAM 1020	Beta Attenuation Monitor Model 1020
BLM	United States Bureau of Land Management
BP	United States Border Patrol
CAA	Clean Air Act
CARB	California Air Resources Board
CMP	Conservation Management Practice
DCP	Dust Control Plan
DPR	California Department of Parks and Recreation
EER	Exceptional Events Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GOES-W/E	Geostationary Operational Environmental Satellite (West/East)
HF	Historical Fluctuations
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
ICAPCD	Imperial County Air Pollution Control District
ITCZ	Inter Tropical Convergence Zone
KBLH	Blythe Airport
KCZZ	Campo Airport
KIPL	Imperial County Airport
KNJK	El Centro Naval Air Station
KNYL/MCAS	Yuma Marine Corps Air Station
KPSP	Palm Springs International Airport
KTRM	Jacqueline Cochran Regional Airport (aka Desert Resorts Rgnl Airport)
PST	Local Standard Time
MMML/MXL	Mexicali, Mexico Airport
MODIS	Moderate Resolution Imaging Spectroradiometer
MPH	Miles Per Hour
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standard
NCAR	National Center for Atmospheric Research
NCEI	National Centers for Environmental Information
NEAP	Natural Events Action Plan
NEXRAD	Next-Generation Radar
NOAA	National Oceanic and Atmospheric Administration
nRCP	Not Reasonably Controllable or Preventable
NWS	National Weather Service
PDT	Pacific Daylight Time

PM_{10}	Particulate Matter less than 10 microns
$PM_{2.5}$	Particulate Matter less than 2.5 microns
PST	Pacific Standard Time
QA/QC	Quality Assured and Quality Controlled
QCLCD	Quality Controlled Local Climatology Data
RACM	Reasonable Available Control Measure
RAWS	Remote Automated Weather Station

I Introduction

On November 25, 2015, State and Local Ambient Air Monitoring Stations (SLAMS), located in Brawley (AQS Site Code 060250007) and Niland (AQS Site Code 060254004), California measured an exceedance of the National Ambient Air Quality Standard (NAAQS). Federal Equivalent Method (FEM) Beta Attenuation Monitors Model 1020 (BAM 1020) measured (midnight to midnight) 24-hr average Particulate Matter less than 10 microns (PM_{10}) concentrations of 215 $\mu g/m^3$ and 193 $\mu g/m^3$ (**Table 1-1**). PM_{10} 24-hr measurements above 150 $\mu g/m^3$ are exceedances of the NAAQS. The SLAMS in Brawley and Niland were the only stations in Imperial County to measure an exceedance of the PM_{10} NAAQS on November 25, 2015.

TABLE 1-1
CONCENTRATIONS OF PM_{10} ON NOVEMBER 25, 2015

DATE	MONITORING SITE	AQS ID	POC(s)	HOURS	24-HOUR CONCENTRATION $\mu g/m^3$	PM_{10} NAAQS $\mu g/m^3$
11/25/2015	**Niland**	**06-025-4004**	**3**	**22**	**193**	**150**
11/25/2015	**Brawley**	**06-025-0007**	**3**	**22**	**215**	**150**
11/25/2015	Westmorland	06-025-4003	3	21	139	150
11/25/2015	El Centro	06-025-1003	3	24	93	150

All time referenced throughout this document is in Pacific Standard Time (PST) unless otherwise noted[1]

The Imperial County Air Pollution Control District (ICAPCD) has been submitting PM_{10} data from Federal Reference Method (FRM) Size-Selective Inlet (SSI) instruments since 1986 into the United States Environmental Protection Agency's (USEPA) Air Quality System (AQS). Prior to 2013, all continuous measured PM_{10} data was non-regulatory, thus measured in local conditions. However, by 2013 ICAPCD began formally submitting continuous FEM PM_{10} data from BAM 1020's into the USEPA managed AQS. Because regulatory consideration of reported data must be in standard conditions, as required by USEPA, all continuous PM_{10} data since 2013 is regulatory. On November 25, 2015, the Brawley and Niland monitors were impacted by elevated particulate matter caused by the entrainment of fugitive windblown dust from high winds associated with a fairly stationary low-pressure system that moved over the Great Basin and southwest states.

This report demonstrates that a naturally occurring event caused an exceedance observed on November 25, 2015, which elevated particulate matter and affected air quality. The report provides concentration to concentration monitoring site analyses supporting a clear causal relationship between the event and the monitored exceedances and provides an analysis

[1] According to the National Institute of Standards and Technology (NIST) Time and Frequency Division the designation of the time of day for specific time zones are qualified by using the term "standard time" or "daylight time". For year-round use the designation can be left off inferring "local time" daylight or standard whichever is present. For 2015, Pacific Daylight Time (PDT) is March 8 through November 1. https://www.nist.gov/pml/time-and-frequency-division/local-time-faqs#intl

supporting the not reasonably controllable or preventable (nRCP) criteria. Furthermore, the report provides information that the exceedances would not have occurred without the entrainment of fugitive windblown dust from outlying deserts and mountains within the Sonoran Desert. The document further substantiates the request by the ICAPCD to exclude PM_{10} 24-hour NAAQS exceedances of 215 µg/m3 and 193 µg/m3 (**Table 1-1**) as an exceptional event. This demonstration substantiates that this event meets the definition of the USEPA Regulation for the Treatment of Data Influenced by Exceptional Events (EER)[2].

I.1 Demonstration Contents

Section II - Describes the November 25, 2015 event as it occurred in California and into Imperial County, providing background information of the exceptional event and explaining how the event affected air quality. Overall, this section provides the evidence that the event was a natural event.

Section III – Using time-series graphs, summaries and historical concentration comparisons of the Brawley and Niland stations this section discusses and establishes how the November 25, 2015 event affected air quality demonstrating that a clear causal relationship exists between the event and the monitored exceedance. It is perhaps of some value to mention that the time-series graphs include PM_{10} data measured in both local conditions and standard conditions. Measured PM_{10} continuous data prior to 2013 is in local conditions, all other data is in standard conditions. The concentration difference between local and standard conditions has an insignificant impact on any data analysis. Overall, this section provides the evidence that human activity played little or no direct causal role in the November 25, 2015 event and its resulting emissions defining the event as a "natural event".[3]

Section IV - Provides evidence that the event of November 25, 2015 was not reasonably controllable or preventable despite the full enforcement and implementation of Best Available Control Measures (BACM).

Section V - Brings together the evidence presented within this report to show that the exceptional event affected air quality; that the event was not reasonably controllable or preventable; that there was a clear causal relationship between the event and the exceedance, and that the event was a natural event.

I.2 Requirement of the Exceptional Event Rule

The above sections combined comprise the technical requirements described under the Exceptional Events Rule (EER) under 40 CFR §50.14(c)(3)(iv). However, in order for the USEPA to concur with flagged air quality monitoring data, there are additional non-technical requirements.

[2] "Treatment of Data Influenced by Exceptional Events; Final Guidance", 81 FR 68216, October 2, 2016

[3] Title 40 Code of Federal Regulations part 50: §50.1(k) Natural event means an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.

I.2.a Public Notification that a potential event was occurring (40 CFR §50.14(c)(1))

The ICAPCD published the National Weather Service (NWS) forecast synopsis from the San Diego and Phoenix offices. The San Diego office described a low-pressure system over the Great Basin and southwest states. Forecasted cooler temperatures, few periods of light showers and gusty west winds within the mountains and deserts. The Phoenix office described a chilly Pacific weather system moving into the desert southwest bringing cooler temperatures, breezy conditions and a slight chance of mountain showers. Because of the potential for suspended particles and poor air quality, the ICAPCD issued a "No Burn" day in Imperial County. **Appendix A** contains copies of pertinent notices to the November 25, 2015, exceptional event

I.2.b Initial Notification of Potential Exceptional Event (INPEE) (40 CFR §50.14(c)(2))

States are required under federal regulation to submit measured ambient air quality data into the AQS. AQS is the federal repository of Quality Assured and Quality Controlled (QA/QC) ambient air data used for regulatory purposes. When States intend to request the exclusion of one or more exceedances of a NAAQS as an exceptional event a notification to the Administrator is required. Notification occurs when an agency submits a request, which includes an initial event description, for flagging data in AQS.

On October 3, 2016, the US EPA promulgated revisions to the Exceptional Events rule, which included the requirement of an “Initial Notification of Potential Exceptional Event” (INPEE) process. This revised INPEE process requires communication between the US EPA regional office and the State, prior to the development of a demonstration. The intent of the INPEE process is twofold: to determine whether identified data may affect a regulatory decision and whether a State should develop/submit an EE Demonstration.

The ICAPCD made a formal written request to the California Air Resources Board (CARB) to place preliminary flags on SLAMS measured PM_{10} concentration from the Brawley and Niland monitors on March 7, 2016. Subsequently there after the ICAPCD sent a revised request on March 18, 2016 providing additional information describing the event. **Table 1-1** above provides the correct concentration for Brawley and Niland. The difference in concentrations between local and standard has an insignificant impact on any data analysis. The submitted request included a brief description of the meteorological conditions for November 25, 2015 indicating that a potential natural event occurred.

I.2.c Documentation that the public comment process was followed for the event demonstration that was flagged for exclusion (40 CFR §50.14(c)(3)(v))

The ICAPCD posted, for a 30-day public review, a draft version of this demonstration on the ICAPCD webpage and published a notice of availability in the Imperial Valley Press on June 28, 2018. The published notice invited comments by the public regarding the request, by the ICAPCD, to exclude the measured concentrations of 193 µg/m^3 and 215 µg/m^3 (**Table 1-1**), which occurred

on November 25, 2015 in Niland and Brawley, respectively. The final closing date for comments was July 30, 2018. **Appendix A** contains a copy of the public notice affidavit along with any comments received by the ICAPCD for submittal as part of the demonstration (40 CFR §50.14(c)(3)(v)).

I.2.d Documentation submittal supporting an Exceptional Event Flag (40 CFR §50.14(c)(3)(i))

States that have flagged data as a result of an exceptional event and who have requested an exclusion of said flagged data are required to submit a demonstration that justifies the data exclusion to the USEPA in accordance with the due date established by USEPA during the INPEE process (40 CFR §50.14(c)(2)). Currently, bi-weekly meetings between USEPA, CARB and Imperial County are set to discuss each flagged exceedance for 2015.

The ICAPCD, after the close of the comment period and after consideration of the comments will submit this demonstration along with all required elements, including received comments and responses to USEPA Region 9 in San Francisco, California. The submittal of the November 25, 2015 demonstration will have a regulatory impact upon the development and ultimate submittal of the PM_{10} State Implementation Plan for Imperial County in 2018.

I.2.e Necessary demonstration to justify an exclusion of data under (40 CFR§50.14(c)(3)(iv))

A This demonstration provides evidence that the event, as it occurred on November 25, 2015 satisfies the definition in 40 CFR §50.1(j) and (k) for an exceptional event.

- a The event created the meteorological conditions that entrained emissions and caused the exceedance.
- b The event clearly "affects air quality" such that there is the existence of a clear causal relationship between the event and the exceedance.
- c Analysis demonstrates that the event-influenced concentrations compared to concentrations at the same monitor at other times supports the clear causal relationship.
- d The event "is not reasonably controllable and not reasonably preventable."
- e The event is "caused by human activity that is unlikely to recur at a particular location or [is] a natural event."
- f The event is a "natural event" where human activity played little or no direct causal role.

B This demonstration provides evidence that the exceptional event affected air quality in Imperial County by demonstrating a clear causal relationship between the event and the measured concentrations in Brawley and Niland.

C This demonstration provides evidence of the measured concentrations to concentrations at the same monitor at other times supporting the clear causal relationship between the event and the affected monitors.

II November 25, 2015 Conceptual Model

This section provides a summary description of the meteorological and air quality conditions under which the November 25, 2015 event unfolded in Imperial County. The subsection elements include:

- » A description and map of the geographic setting of the air quality and meteorological monitors
- » A description of Imperial County's climate
- » An overall description of meteorological and air quality conditions on the event day.

II.1 Geographic Setting and Monitor Locations

According to the United States Census Bureau, Imperial County has a total area of 4,482 square miles of which 4,177 square miles is land and 305 square miles is water. Much of Imperial County is below sea level and is part of the Colorado Desert an extension of the larger Sonoran Desert (**Figure 2-1)**. The Colorado Desert not only in includes Imperial County but a portion of San Diego County.

FIGURE 2-1
COLORADO DESERT AREA IMPERIAL COUNTY

Fig 2-1: 1997 California Environmental Resources Evaluation System. According to the United States Geological Survey (USGS) Western Ecological Research Center the Colorado Desert bioregion is part of the bigger Sonoran Desert Bioregion which includes the Colorado Desert and Upper Sonoran Desert sections of California and Arizona, and a portion of the Chihuahuan Basin and Range Section in Arizona and New Mexico (Forest Service 1994)

A notable feature in Imperial County is the Salton Sea, which is at approximately 235 feet below sea level. The Chocolate Mountains are located east of the Salton Sea and extend in a northwest-southeast direction for approximately 60 miles (**Figure 2-2)**. In this region, the geology is dominated by the transition of the tectonic plate boundary from rift to fault. The southernmost strands of the San Andreas Fault connect the northern-most extensions of the East Pacific rise. Consequently, the region is subject to earthquakes and the crust is being stretched, resulting in a sinking of the terrain over time.

FIGURE 2-2
SURROUNDING AREAS OF THE SALTON SEA

Fig 2-2: Image courtesy of the Image Science and Analysis Laboratory NASA Johnson Space Center, Houston Texas

All of the seven incorporated cities, including the unincorporated township of Niland, are surrounded by agricultural fields to the north, east, west and south (**Figure 2-6)**. Together, the incorporated cities, including Niland, and the agricultural fields make what is known as the Imperial Valley. Surrounding the Imperial Valley are desert areas found on the eastern and western portions of Imperial County.

The desert area, found within the western portion of Imperial County is of note because of its border with San Diego County. From west to east, San Diego County stretches from the Pacific Ocean to its boundary with Imperial County. San Diego County has a varied topography. On its western side is 70 miles (110 km) of coastline. Most of San Diego between the coast and the Laguna Mountains consists of hills, mesas, and small canyons. Snow-capped (in winter) mountains rise to the northeast, with the Sonoran Desert to the far east. Cleveland National

Forest is spread across the central portion of the county, while the Anza-Borrego Desert State Park occupies most of the northeast. The southeastern portion of San Diego County is comprised of distinctive Peninsular mountain ranges. The mountains and deserts of San Diego comprise the eastern two-thirds of San Diego County and are primarily undeveloped back county with a native plant community known as chaparral. Of the nine major mountain ranges within San Diego County, the In-Ko-Pah Mountains and the Jacumba Mountains border Mexico and Imperial County.

Both mountain ranges provide the distinctive weathered dramatic piles of residual boulders that can be seen while driving Interstate 8 from Imperial County through Devil's Canyon and In-Ko-Pah Gorge. Interstate 8 runs along the US border with Mexico from San Diego's Mission Bay to just southeast of Casa Grande Arizona.

FIGURE 2-3
JACUMBA PEAK

Fig 2-3: The Jacumba Mountains reach an elevation of 4,512 feet (1,375 m) at Jacumba Peak, near the southern end of the chain. Source: Wikipedia at https://en.wikipedia.org/wiki/Jacumba_Mountains

Northwest and northeast of the Jacumba Mountains is the Tierra Blanca Mountains, the Sawtooth Mountains and Anza-Borrego Desert State Park. Within the mountain ranges and the Anza-Borrego Desert State Park, there exists the Vallecito Mountains, the Carrizo Badlands, the Carrizo Impact Area, Coyote Mountains and the Volcanic Hills to name of few. Characteristically, these areas all have erosion that has occurred over time that extends from the Santa Rosa Mountains into northern Baja California in Mexico. For example, the Coyote Mountains consists of sand dunes left over from the ancient inland Sea of Cortez. Much of the terrain is still loose dirt, interspersed with sandstone and occasional quartz veins. The nearest community to the Coyote Mountain range is the community of Ocotillo. Of interest are the fossilized and hollowed out sand dunes that produce wind caves.

FIGURE 2-4
ANZA-BORREGO DESERT STATE PARK
CARRIZO BADLANDS

Fig 2-4: View southwest across the Carrizo Badlands from the Wind Caves in Anza-Borrego Desert State Park. Source: Wikipedia at https://en.wikipedia.org/wiki/Carrizo_Badlands

The Carrizo Badlands, which includes the Carrizo Impact Area used by the US Navy as an air-to-ground bombing range during World War II and the Korean War, lies within the Anza-Borrego Desert State Park. The Anza-Borrego Desert State Park is located within the Colorado Desert, is the largest state park in California occupying eastern San Diego County, reaching into Imperial and Riverside counties. The two communities within Anza-Borrego Desert State Park are Borrego Springs and Shelter Valley.

The Anza-Borrego Desert State Park lies in a unique geologic setting along the western margin of the Salton Trough. The area extends north from the Gulf of California to San Gorgonio Pass and from the eastern rim of the Peninsular Ranges eastward to the San Andreas Fault zone along the far side of the Coachella Valley. The Anza-Borrego region changed gradually over time from intermittently being fed by the Colorado River Delta to dry lakes and erosion from the surrounding mountain ranges. The area located within the southeastern and northeastern section of San Diego County is a source of entrained fugitive dust emissions that impact Imperial County when westerly winds funnel through the unique landforms causing in some cases wind tunnels that cause increases in wind speeds.

Historical observations have indicated that the desert slopes and mountains of San Diego are a source of fugitive emissions along with those deserts located to the east and west of Imperial County, which extend into Mexico (Sonoran Desert, **Figure 2-7**). Combined, the desert areas and mountains of San Diego and the desert areas that extend into Mexico are sources of dust emissions, which affect the Imperial County during high wind events.

FIGURE 2-5
ANZA-BORREGO DESERT STATE PARK
DESERT VIEW FROM FONT'S POINT

Fig 2-5: Desert view from Font's Point. Source: Font's Point Anza-Borrego Photographed by and copyright of (c) David Corby; Wikipedia at https://en.wikipedia.org/wiki/Anza-Borrego_Desert_State_Park

FIGURE 2-6
LOCATION AND TOPOGRAPHY OF IMPERIAL COUNTY

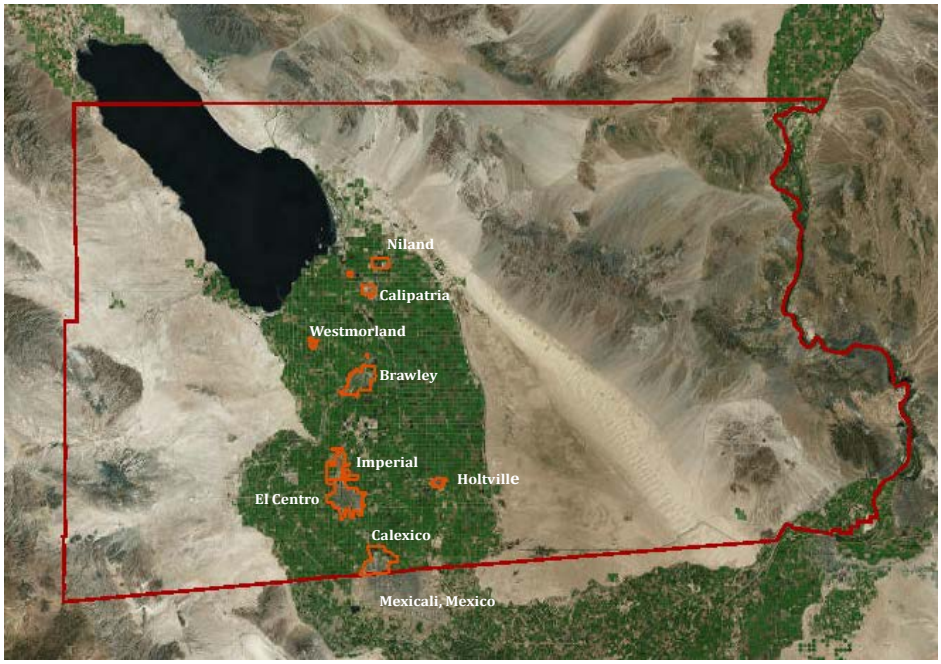


Fig. 2-6: Depicts the seven incorporated cities within Imperial Valley - City of Calipatria, City of Westmorland, City of Brawley, City of Imperial, City of El Centro, City of Holtville, and the City of Calexico. Niland is unincorporated. Mexicali, Mexico is to the south.

FIGURE 2-7
DESERTS IN CALIFORNIA, YUMA AND MEXICO

Fig 2-7: Depicts the Sonoran Desert as it extends from Mexico into Imperial County. Source: Google Earth Terra Matrics

The air quality and meteorological monitoring stations used in this demonstration are shown in **Figure 2-8**. Of the five SLAMS within Imperial County four stations measure both meteorological and air quality data. These SLAMS are located in Calexico, El Centro, Westmorland, and Niland; the station located in Brawley only measures air quality. Other air monitoring stations measuring air quality and meteorological data used for this demonstration include stations in eastern Riverside County, southeastern San Diego County and southwestern Arizona (Yuma County) (**Figure 2-8 and Table 2-1)**.

As mentioned above, the PM_{10} exceedances on November 25, 2015 occurred at the Brawley and Niland stations. The Brawley, Niland and Westmorland stations are regarded as the "northern" monitoring sites within the Imperial County air monitoring network. In order to properly analyze the contributions from meteorological conditions occurring on November 25, 2015, other meteorological sites were used in this demonstration which include airports in eastern Riverside County, southeastern San Diego County, southwestern Arizona (Yuma County), Imperial County, and other sites relevant to the wind event, such as within northern Mexico. (**Figure 2-8)**.

FIGURE 2-8
MONITORING SITES IN AND AROUND IMPERIAL COUNTY

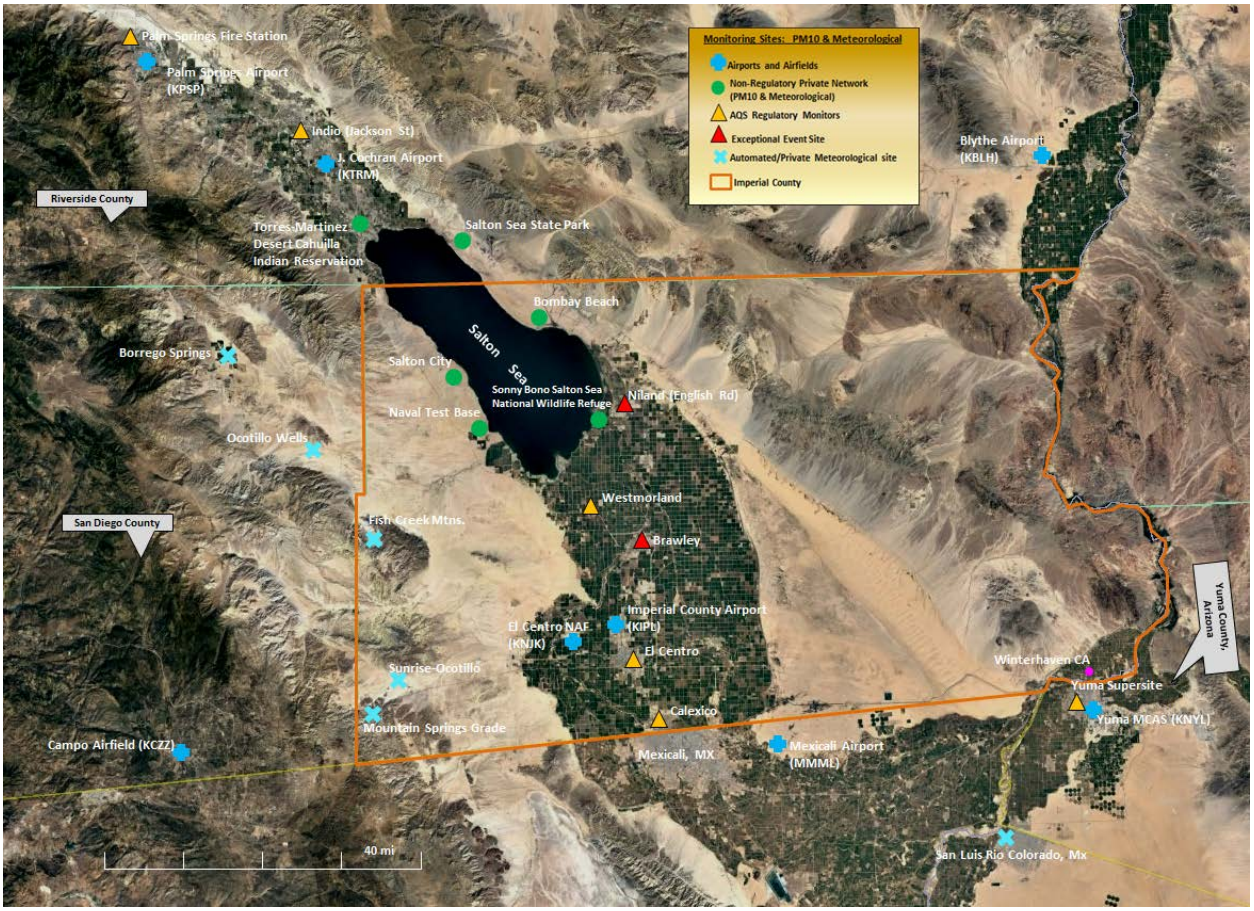


Fig 2-8: Depicts a select group of meteorological and PM_{10} monitoring sites in Imperial County, eastern Riverside County, southeastern San Diego County, southwestern Arizona (Yuma County), and northern Mexico. The image provides the location of potential sites used to gather data in support an Exceptional Event Demonstration. Source: Google Earth.

In addition to meteorological sites, there are non-regulatory PM_{10} sites located around the Salton Sea that maybe referenced as an aid to help the reader understand the direction and velocity of winds that affect Imperial County. Unless, otherwise specifically indicated concentration references do not imply emissions from the surrounding playa of the Salton Sea. Three sites, in specific, are the Salton City air monitoring station, the Naval Test Base air monitoring station and the Sonny Bono air monitoring station. These privately owned stations are non-regulatory (**Figures 2-9 to 2-12**). The Salton City station is located 33.27275°N latitude and 115.90062˚W longitude, on the western edge of the Salton Sea (**Figure 2-9**). The station abuts a water reservoir along the Salton Sea with surrounding chaparral vegetation and unpaved open areas and roads. The Naval Test Base station is located 33.16923°N latitude and 115.85593˚W longitude, on the southwestern edge of the Salton Sea (**Figure 2-11**). The station sits on an abandoned US Military site, still owned by the Department of Defense. Unlike the Salton City station, light chaparral

vegetation and sandy open dune areas surround the Naval Test Base station. Directly to the west of the station is an orchard. The Sonny Bono station is located 33.17638°N latitude and 115.62310˚W longitude, on the southern portion of the Salton Sea within the Sonny Bono Salton Sea Wildlife Refuge. The Sonny Bono Salton Sea National Wildlife Refuge is 40 miles north of the Mexican border at the southern end of the Salton Sea within the Sonoran Desert. The Refuge has two separate managed units, 18 miles apart. Each unit contains wetland habitats, farm fields, and tree rows. The land of the Salton Sea Refuge is flat, except for Rock Hill, a small, inactive volcano, located near Refuge Headquarters. Bordering the Refuge is the Salton Sea on the north and farmlands on the east, south, and west.

FIGURE 2-9
SALTON CITY AIR MONITORING STATION

Fig 2-9: Depicts the Salton City air monitoring (circled) site operated by a private entity. View site photos at the California Air Resources Board monitoring website at https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-10
SALTON CITY AIR MONITORING STATION
WEST

Fig 2-10: Photograph taken by the California Air Resources Board audit team in 2017. The photograph taken from the west facing the probe. https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-11
NAVAL TEST BASE AIR MONITORING STATION

Fig 2-11: Depicts the Naval Test Base air monitoring (circled) site operated by a private entity. To view the site photos visit the California Air Resources Board monitoring website at https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13603&date=17

FIGURE 2-12
NAVAL TEST BASE AIR MONITORING STATION
WEST

Fig 2-12: Photograph taken by the California Air Resources Board audit team in 2017. The photograph taken from the west facing the probe. https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-13
SONNY BONO AIR MONITORING STATION

Fig 2-13: Depicts the Sonny Bono air monitoring (circled) site operated by a private entity. To view the site photos visit the California Air Resources Board monitoring website at https://www.arb.ca.gov/qaweb/sitephotos.php?site_no=13604&date=17

FIGURE 2-14
SONNY BONO SALTON SEA NATIONAL WILDLIFE REFUGE

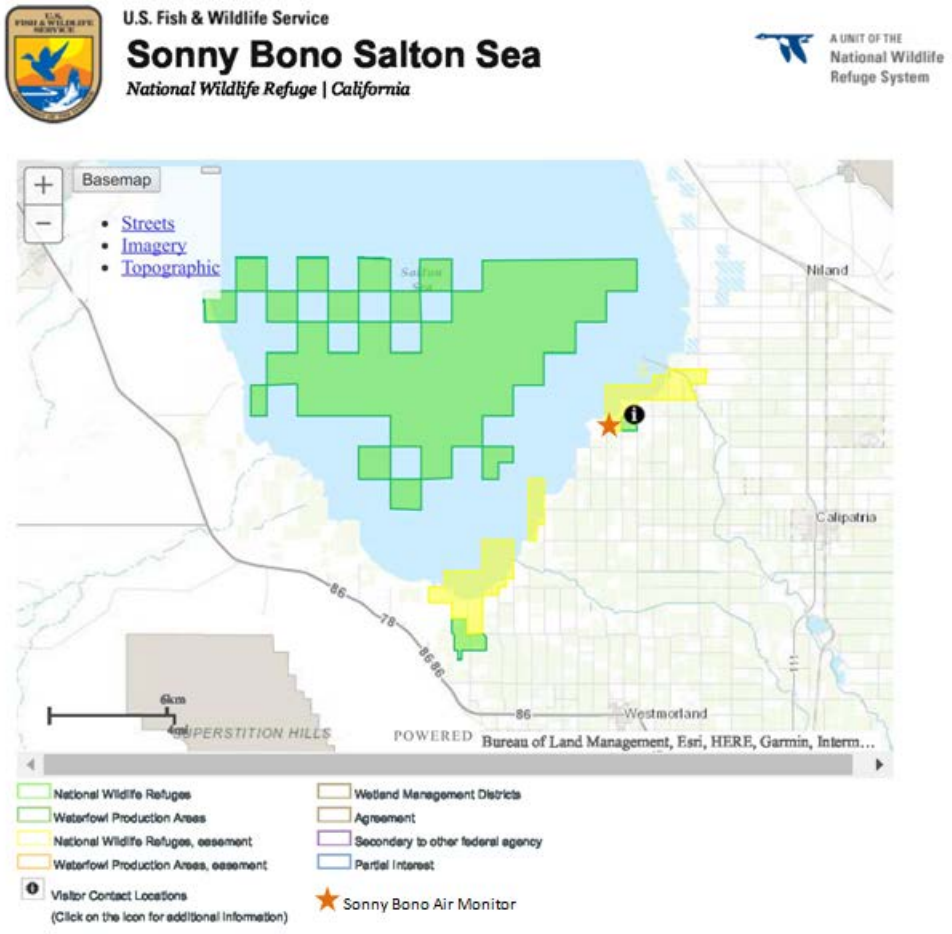


Fig 2-14: The Sonny Bono Wildlife Refuge has about 2,000 acres that are farmed and managed for wetlands. In 1998, the Refuge was renamed after Congressman Sonny Bono, who helped inform the U.S. Congress of the environmental issues facing the Salton Sea as well as acquiring funding for this Refuge to help it respond to avian disease outbreaks and other habitat challenges at the Salton Sea. Source: https://www.fws.gov/refuge/Sonny_Bono_Salton_Sea/about.html

TABLE 2-1
MONITORING SITES IN IMPERIAL COUNTY, RIVERSIDE COUNTY AND ARIZONA
NOVEMBER 25, 2015

Monitor Site Name	*Operator	Monitor Type	AQS ID	AQS PARAMETER CODE	ARB Site Number	Elevation (meters)	24-hr PM_{10} ($\mu g/m^3$) Avg	1-hr PM_{10} ($\mu g/m^3$) Max	**Time of Max Reading	Max Wind Speed (mph)	**Time of Max Wind Speed
IMPERIAL COUNTY											
Brawley-Main Street #2	ICAPCD	Hi-Vol Gravimetric	06-025-0007	(81102)	13701	-15	-	-	-	-	-
		BAM 1020					215	978	0900		
Calexico-Ethel Street	CARB	Hi-Vol Gravimetric	06-025-0005	(81102)	13698	3	-	-	-	20.3	0900
El Centro-9th Street	ICAPCD	Hi-Vol Gravimetric	06-025-1003	(81102)	13694	9	-	-	-	16.3	0300
		BAM 1020					93	316	1100		
Niland-English Road	ICAPCD	Hi-Vol Gravimetr	06-025-4004	(81102)	13997	-57	-	-	-	33.8	1000
		BAM 1020					193	972	0800		
Westmorland	ICAPCD	Hi-Vol Gravimetric	06-025-4003	(81102)	13697	-43	-	-	-		
		BAM 1020					139	853	1200	20.3	1000
RIVERSIDE COUNTY											
Palm Springs Fire Station	SCAQMD	TEOM	06-065-5001	(81102)	33137	174	18	34	1300	-	-
Indio (Jackson St.)	SCAQMD	TEOM	06-065-2002	(81102)	33157	1	27	81	1000	-	-
ARIZONA – YUMA											
Yuma Supersite	ADEQ	TEOM	04-027-8011	(81102)	N/A	60	111	376	1300	-	-

*CARB = California Air Resources Board
*ICAPCD = Air Pollution Control District, Imperial County
*SCAQMD = South Coast Air Management Quality District
*ADEQ =Arizona Department of Environmental Quality

**Time represents the actual time/hour of the measurement in question according to the zone time (PST unless otherwise noted)
November 25, 2015 was not a scheduled sampling day

II.2 Climate

As mentioned above, Imperial County is part of the Colorado Desert, which is a subdivision of the larger Sonoran Desert (**Figure 2-15**) encompassing approximately 7 million acres (28,000 km^2). The desert area encompasses Imperial County and includes parts of San Diego County, Riverside County, and a small part of San Bernardino County.

FIGURE 2-15
SONORAN DESERT REGION

Fig 2-15: Depicts the magnitude of the region known as the Sonoran Desert. Source: Arizona-Sonora Desert Museum at http://desertmuseum.org/center/map.php

The majority of the Colorado Desert lies at a relatively low elevation, below 1,000 feet (300 m), with the lowest point of the desert floor at 275 feet (84 m) below sea level at the Salton Sea. Although the highest peaks of the Peninsular Range reach elevations of nearly 10,000 feet (3,000 m), most of the region's mountains do not exceed 3,000 feet (910 m).

In the Colorado Desert (Imperial County), the geology is dominated by the transition of the tectonic plate boundary from rift to fault. The southernmost strands of the San Andreas Fault connect to the northern-most extensions of the East Pacific Rise. Consequently, the region is subject to earthquakes, and the crust is being stretched, resulting in a sinking of the terrain over time.

The Colorado Desert's climate distinguishes it from other deserts. The region experiences greater summer daytime temperatures than higher-elevation deserts and almost never experiences frost. In addition, the Colorado Desert experiences two rainy seasons per year (in the winter and late summer), especially toward the southern portion of the region which includes a portion of San Diego County. The Colorado Desert portion of San Diego County receives the least amount of precipitation. Borrego Springs, the largest population center within the San Diego desert region averages 5 inches of rain with a high evaporation rate. By contrast, the more northerly Mojave Desert usually has only winter rains.

The west coast Peninsular Ranges, or other west ranges, of Southern California–northern Baja California, block most eastern Pacific coastal air and rains, producing an arid climate. Other short or longer-term weather events can move in from the Gulf of California to the south, and are often active in the summer monsoons. These include remnants of Pacific hurricanes, storms from the southern tropical jet stream, and the northern Inter Tropical Convergence Zone (ITCZ).

The arid nature of the region is demonstrated when historic annual average precipitation levels in Imperial County average 3.11" (**Figure 2-16)**. During the 12-month period prior to November 25, 2015, Imperial County recorded total annual precipitation of 1.97 inches. Such arid conditions, as those preceding the event, result in soils that are particularly susceptible to particulate suspension by the elevated gusty winds.

FIGURE 2-16
IMPERIAL COUNTY HISTORICAL WEATHER

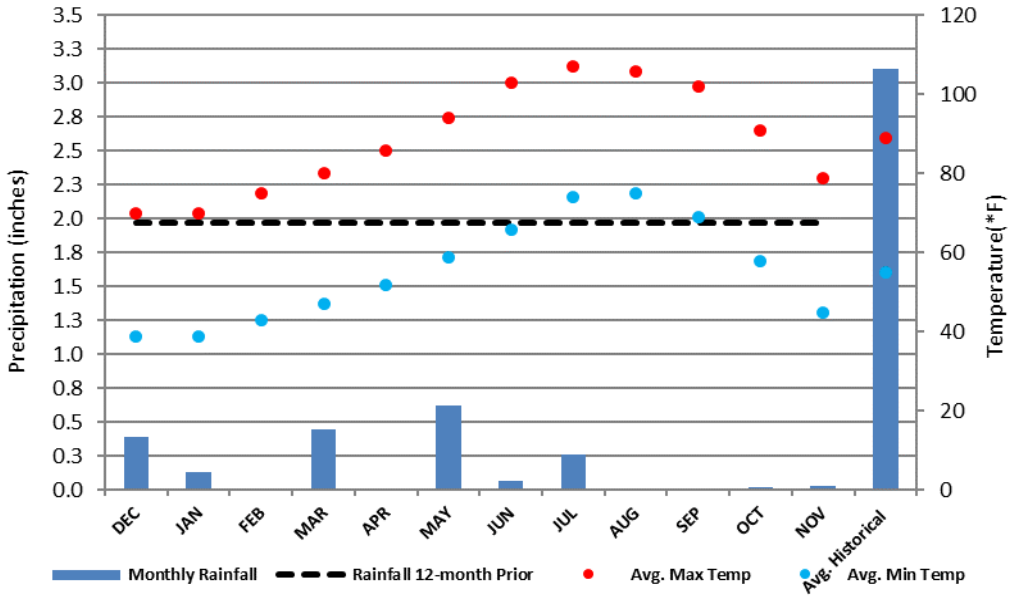


Fig 2-16: Historical Imperial County weather. Prior to November 25, 2015, the region suffered abnormally low total annual precipitation of 1.97 inches. Average annual precipitation is 3.11 inches. Meteorological data courtesy of Western Regional Climate Center (WRCC) and Weather Underground
https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca2713

The NWS explains that the speed of any wind resulting from a weather system is directly proportional to the change in air pressure, called a pressure gradient, such that when the pressure gradient increases so does the speed of the wind.[4] Because the pressure gradient is just the difference in pressure between high and low pressure areas, changes in weather patterns may recur seasonally.

Typically, high pressure brings clear skies and with no clouds, there is more incoming shortwave solar radiation causing temperatures to rise. When surface winds become light, the cooling of the air produced directly under a high-pressure system can lead to a buildup of particulates in urban areas under an elongated region of relatively high atmospheric pressure or ridge causing widespread haze. Conversely, a trough is an elongated region of relatively low atmospheric pressure often associated with fronts. Troughs may be at the surface, or aloft under various conditions. Most troughs bring clouds, showers, and a wind shift, particularly following the passage of the trough.

While windblown dust events in Imperial County during the summer monsoon season are often due to outflow winds from thunderstorms, windblown dust events in the fall, winter, and spring are usually due to strong winds associated with low-pressure systems and cold fronts moving southeast across California. These winds are the result of strong surface pressure gradients between the approaching low-pressure system, accompanying cold front, and higher pressure ahead of it. As the low-pressure system and cold front approaches and passes, gusty southwesterly winds typically shift to northwesterly causing variable west winds. These strong winds entrain dust into the atmosphere and transport it over long distances, especially when soils are arid.

II.3 Event Day Summary

The exceptional event for November 25, 2015, caused by a low-pressure system that moved southward through the western states, essentially was a winter storm over the Pacific northwest. The cold upper low, situated over the Oregon/California border moved south stalling over the Great Basin Wednesday through Sunday. This brought an extended period of cool weather. As the low-pressure moved southward stronger onshore flow brought areas of gusty southwest to west winds within the San Diego mountains and deserts.

As the onshore flow strengthened across Southern California, on Tuesday, November 24, 2015, periods of stronger and gusty southwest to west winds measured along mountain ridge tops and along desert slopes blew into Imperial County during the afternoon to evening hours of November 24, 2015 through November 25, 2015 affecting air quality and causing an exceedance at the Brawley and Niland monitors.

Figures 2-17 through 2-20 provide information regarding the incoming Pacific weather system, low-pressure and cold front, the tightening of the pressure gradient and the westerly wind

[4] NWS JetStream – Origin of Wind http://www.srh.noaa.gov/jetstream/synoptic/wind.html

speeds.

FIGURE 2-17
UPPER LEVEL LOW OVER NORTHERN CALIFORNIA

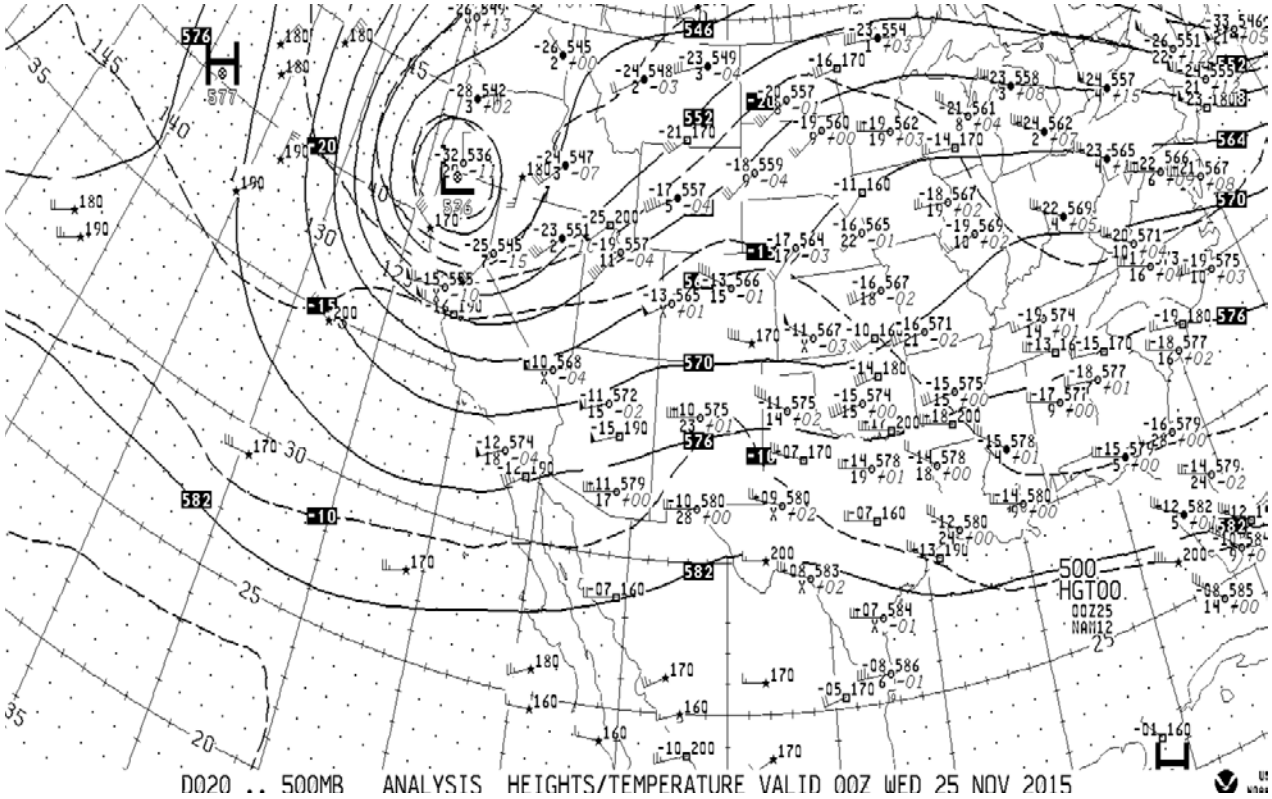


Fig 2-17: A 500mb height map (16:00 November 24, 2015 PST) shows an upper-level low centered over Eureka, California. The low was responsible for steering a surface low over the Southwest. Source: Colorado State University Department of Atmospheric Science; http://archive.atmos.colostate.edu/data/misc/QHTA11/1511

FIGURE 2-18
GOES E-W SURFACE COMPOSITE SATELLITE IMAGE

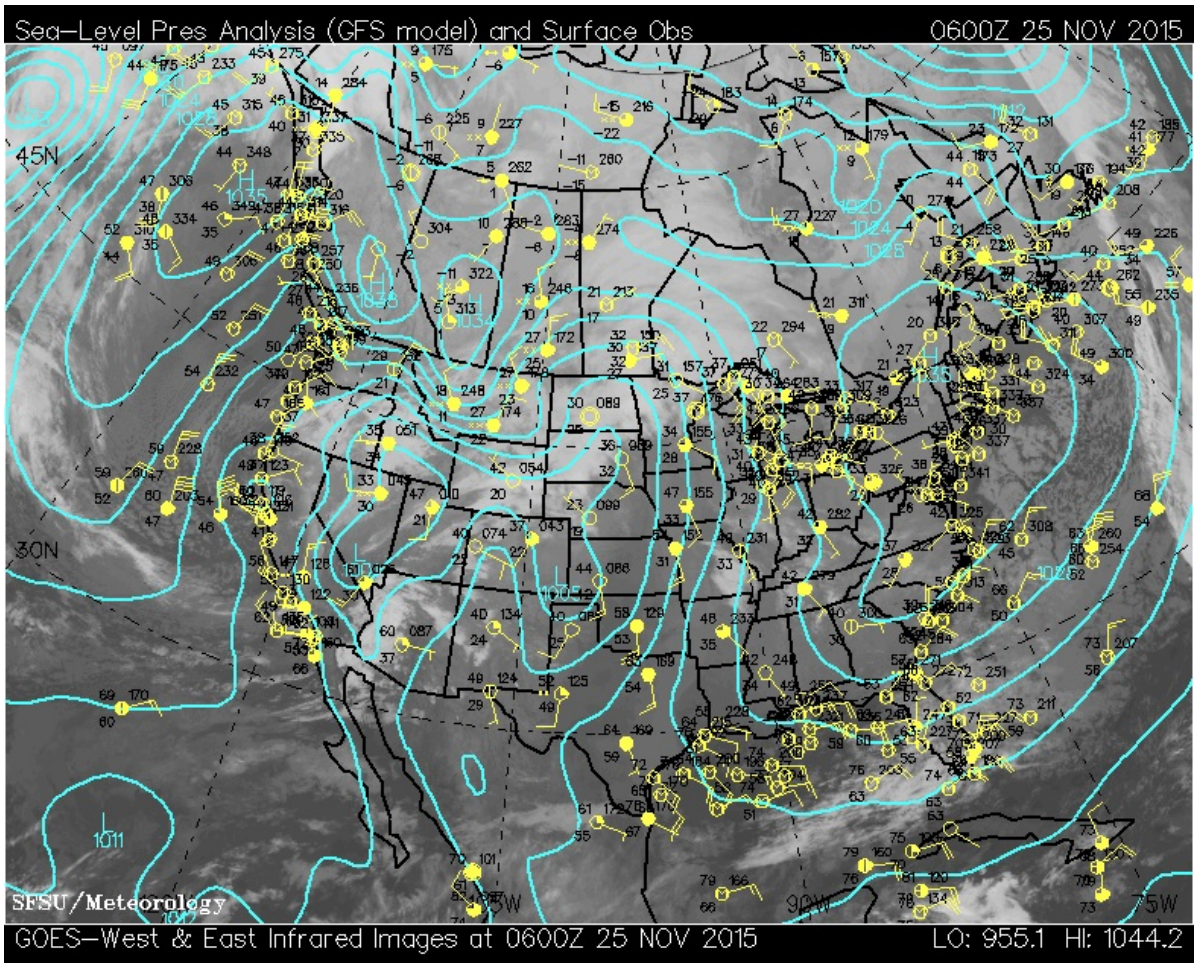


Fig 2-18: A GOES E-W surface composite satellite image at 2200 PST on November 24, 2015 shows a surface low pressure system over the Great Basin. The strengthening of the onshore flow brought gusty west winds to southeastern California. Source: SFSU Department of Earth & Climate Sciences and the California Regional Weather Server; http://squall.sfsu.edu/crws/archive/wcsathts_arch.html

FIGURE 2-19
SURFACE ANALYSIS MAPS TIGHTENING PRESSURE GRADIENT

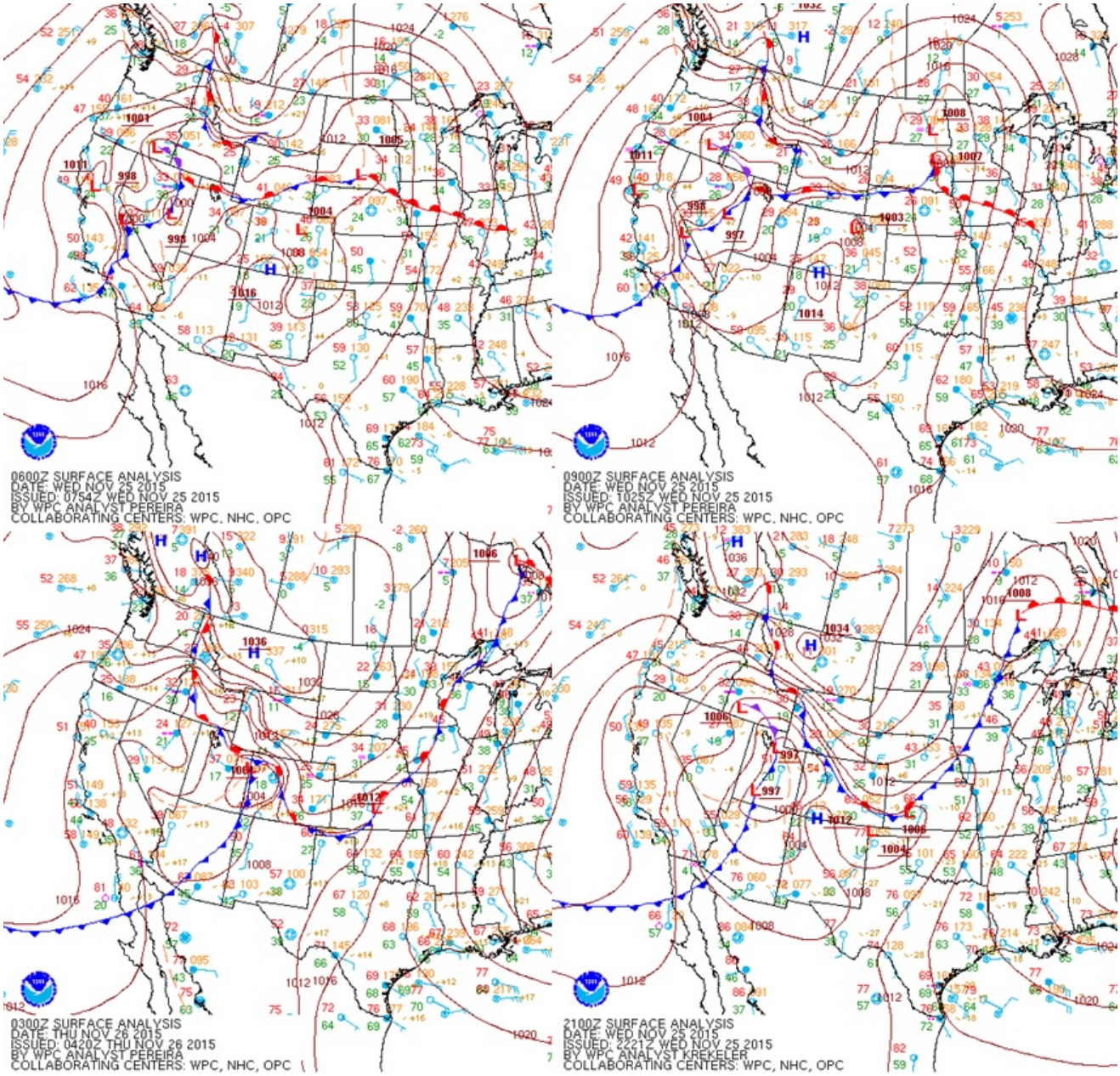


Fig 2-19: A quad of surface analysis maps that show the tightening of the pressure gradient that led to the high winds across southeastern California and Imperial County. The images are (clockwise, from top left) 2200 PST November 24, 2015; 0100 PST; 1300 PST; and 1900 PST November 25, 2015. The gradient was tightest at 0100 PST. The images also show the progression through southern California of the cold front that was associated with the surface low. Source: Weather Prediction center Surface Analysis Archive; http://www.wpc.ncep.noaa.gov/archives/web_pages/sfc/sfc_archive.php

FIGURE 2-20
GOES-W INFRARED IMAGE NOVEMBER 25, 2015

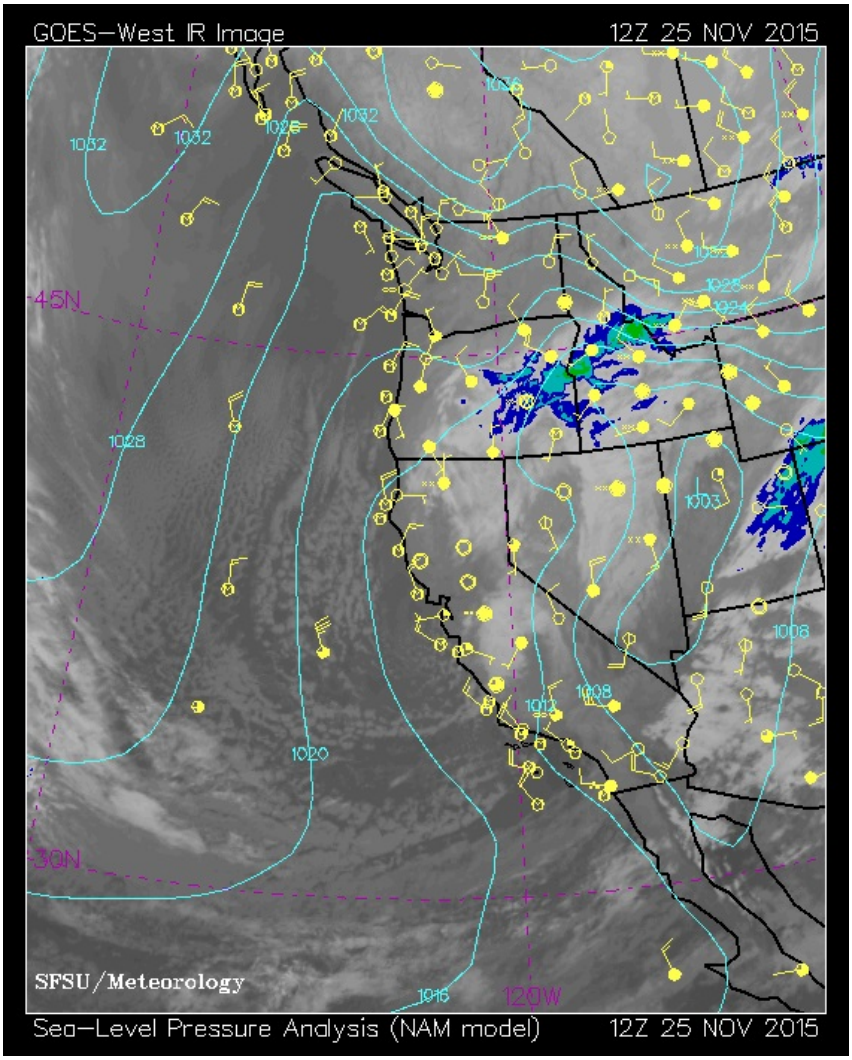


Fig 2-20: A GOES-W infrared composite satellite image (0400 PST) shows westerly winds of about 23 mph, although surface wind stations in the area measured much stronger winds over southeastern California. Source: SFSU Department of Earth and Climate Sciences and the California Regional Weather Server; http://squall.sfsu.edu/crws/archive/wcsathts_arch.html

As early as Sunday, November 22, 2015 the San Diego NWS office issued an Area Forecast Discussion, 2108 PST, that identified the development of a low-pressure over the Great Basin by Wednesday, November 25, 2015. The days leading up to Wednesday, November 25, 2015, the San Diego NWS office discussions explained that the strong low, which originated over western British Columbia intensified and moved rapidly south down the west coast Tuesday, November 24, 2015 and Wednesday, November 25, 2015. As the upper low gets cut off the jet stream and stalls over the Great Basin, an extended period of cool cyclonic flow and below average temperatures are brought to the region. The trough brought scattered light showers, colder

weather and gusty winds Tuesday night into Wednesday. As a result, during the evening hours of Monday, November 23, 2015 the San Diego NWS office issued its first of seven Urgent Weather messages containing wind advisories.

The wind advisories advised of strong and gusty southwest to west winds in the mountains and deserts for late Tuesday, November 24, 2015 through late Wednesday, November 25, 2015. West winds 20 to 30 mph with gusts to 50 mph along mountain ridges, through and below mountain passes and canyons, and along desert slopes transported dust into Imperial County during the afternoon to evening hours of Tuesday, November 24, 2015. Transported dust caused air monitors in Imperial County to measure elevated concentrations as early as 1000 PST November 24, 2015 with a 24-hour average below the NAAQS. The strongest winds occurred during the late evening hours of November 24, 2015 into November 25, 2015.

The Public Information Statement released by the San Diego NWS office at 1057 PST on Wednesday, November 25, 2015 identified peak wind speeds within the Coachella Valley ranging between 30 mph and 52 mph with Palm Desert measuring 52 mph peak winds. Within the San Diego County deserts peak winds ranged between 34 mph and 48 mph with Borrego Springs measuring 48 mph, Ocotillo Wells 43 mph and In Ko Pah measured 41 mph. Within the San Diego County Mountains peak winds ranged between 30 mph and 68 mph with Volcan Mountain measuring 68 mph, Harrison Peak measured 57 mph, Boulevard West measured 45 mph and Campo measured 31 mph. By 1330 PST, November 25, 2015, the San Diego NWS office reported reduced visibilities within the Coachella Valley to less than a mile due to blowing dust. By 1719 PST Wednesday, November 25, 2015, the San Diego NWS office cancelled all wind advisories.

The cold front and initial round of showers that moved through far southern California during the early morning hours of November 25, 2015 had a regional effect upon California and Arizona. Although measurable rainfall amounts ranged from around one quarter inch near the coast to one third to two thirds an inch in the mountains and valleys no measurable rain fell within the Coachella Valley.[5]

Locally, both airports, the El Centro Naval Air Facility (NAF)(KNJK) and the Imperial County Airport (KIPL), and all the air monitoring stations began measuring elevated wind speeds during the evening hours of November 24, 2015. KNJK and KIPL began measuring elevated winds as early as 1756 PST and 1853 PST November 24, 2015 through November 25, 2015. KNJK consistently measured higher wind speeds and gusts with 16 hours of winds at or above 25 mph and 17 hours of gusts between 30 mph and 53 mph. KIPL measured one hour at 25 mph and 16 hours of gusts between 25 mph and 34 mph.

Of the four air monitoring sites, the Niland monitor measured intermittent moderate winds by 0900 PST on November 24, 2015 through the early hours of November 25, 2015, coincident with elevated concentrations of PM_{10}. By 0800 PST, November 25, 2015 the Niland site measured 15 hours of consistently elevated winds with four hours at or above 25 mph, coincident with

[5] Preliminary Storm Precipitation Totals National Weather Service San Diego; 700 am PST Wednesday, November 25, 2015.

measured peak concentrations of PM_{10}. Although the Westmorland site measured lower winds than the Niland monitor, the site did measure 12 hours of moderate winds between the hours of 0800 PST and 1900 PST, November 25, 2015, coincident with measured peak concentrations of PM_{10}. While the El Centro station measured lower wind speeds than the Niland monitor, the elevated winds on November 25, 2015 are coincident with the elevated PM_{10} concentrations. The Calexico station similarly measured moderate winds slightly higher than the El Centro station but lower than the Niland monitor.

FIGURE 2-21
RAMP UP ANALYSIS NOVEMBER 25, 2015

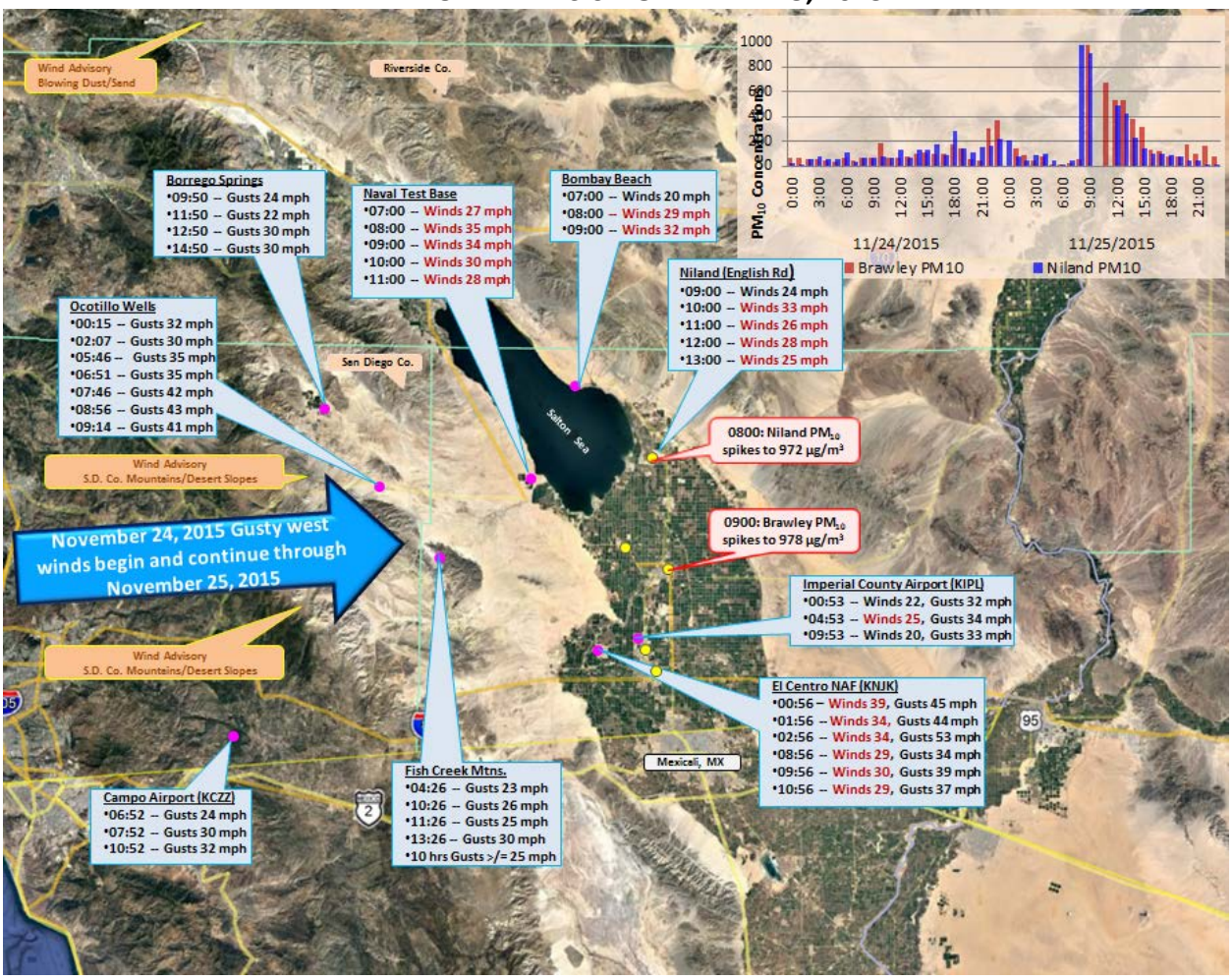


Fig 2-21: Elevated winds commenced during the evening hours of November 24, 2015 through November 25, 2015. Air quality data from the EPA's AQS data bank. Wind data the NCEI's QCLCD system, AQMIS2, and the University of Utah's MesoWest. Base map from Google Earth

Table 2-2 contains a summary of maximum winds, peak wind gusts, and wind direction at monitors in Imperial County, eastern Riverside County, Yuma County, Arizona, and Mexicali. For detailed meteorological station, graphs see **Appendix B**.

TABLE 2-2
WIND SPEEDS ON NOVEMBER 25, 2015

Station Monitor Airport Meteorological Data	Maximum Wind Speed (WS) (mph)	Wind Direction during Max WS (degrees)	*Time of Max Wind Speed	24 hr Maximum Wind Gust (WG) (mph)	Time of Max WG	PM_{10} correlated to time of Max Wind Speed		
						Brly	Nlnd	Wstmd
IMPERIAL COUNTY								
Imperial Airport (KIPL)	24	250	1453	34	1453	378	223	358
Naval Air Facility (KNJK)	39	260	050	53	210	-	204	157
Calexico (Ethel St)	20.3	336	900	-	-	978	917	265
El Centro (9th Street)	16.3	272	300	-	-	45	88	67
Niland (English Rd)	38.8	265	1000	-	-	-	-	-
Westmorland	20.3	284	1000	-	-	-	-	-
RIVERSIDE COUNTY								
Blythe Airport (KBLH)	23	230	1052	31	1052	-	-	-
Palm Springs Airport (KPSP)	18	100	1353	24	1353	530	426	-
Jacqueline Cochran Regional Airport (KTRM) - Thermal	22	270	806	40	818	55	972	24
ARIZONA - YUMA								
Yuma MCAS (KNYL)	22	300	1357	31	1357	530	426	-
MEXICALI - MEXICO								
Mexicali Int. Airport (MXL)	26.5	270	1100	-	-	675	-	-

*All time is in PST unless otherwise stated

National Oceanic and Atmospheric Administration (NOAA) Air Resources Laboratory HYSPLIT back trajectory model,[6] **Figures 2-22 through 2-24** illustrate the path of airflow as it travelled from the mountains and natural open desert areas ending at 2300 PST, November 24, 2015, 0900 PST and 1700 PST November 25, 2015. While surface measurements may differ between different measuring devices, the back trajectories illustrate the general path and level of airflow commencing with November 24, 2015 through November 25, 2015.

All three HYSPLITS illustrate an airflow from the west at all airflow heights, 10 meters, 100 meters and 500 meters. The only exception occurred at the Niland monitor where the path at the 10-meter height took a northerly direction ending at 0900 PST November 25, 2015. The change in airflow at the Niland monitor had little effect because wind speeds at the local airports and at the Niland monitor measured at or above 25 mph.

[6] The Hybrid Single Particle Lagrangian Integrated Trajectory Model (**HYSPLIT**) is a computer model that is a complete system for computing simple air parcel trajectories to complex dispersion and deposition simulations. It is currently used to compute air parcel trajectories and dispersion or deposition of atmospheric pollutants. One popular use of HYSPLIT is to establish whether high levels of air pollution at one location are caused by transport of air contaminants from another location. HYSPLIT's back trajectories, combined with satellite images (for example, from NASA's MODIS satellites), can provide insight into whether high air pollution levels are caused by local air pollution sources or whether an air pollution problem was blown in on the wind The initial development was a result of a joint effort between NOAA and Australia's Bureau of Meteorology. Source: NOAA/Air Resources Laboratory, 2011.

Figure 2-22 includes a 12-hour back-trajectory ending at 2300 PST on November 24, 2015. Airflow is distinctly from the west at all monitors. The surface level airflow is evident for several hours during the late evening hours of November 24, 2015 coincident with the elevated wind speeds at KNJK and KIPL. Transported dust from the mountains and desert slopes of San Diego County would have blown into the desert and agricultural floor of Imperial County allowing for deposition of particulates onto the air monitors. All monitors measured elevated concentrations but did not exceed the NAAQS.

Figure 2-23 includes a 12-hour back-trajectory ending at 0900 PST on November 25, 2015 coincident with the peak hourly concentration measured at the Brawley monitor. Airflow at all heights are distinctly from the west at all monitors except at the Niland monitor. The surface level airflow, 10-meter height, at the Niland monitor there is a north influence hours prior to reaching the monitor. There are several hours of surface level airflow at both the Brawley and Niland monitors, coincident with the strongest measured wind speeds at both KNJK and KIPL. With suspended dust from the previous evening, the transported dust from the mountains and desert slopes of San Diego County would have blown into the desert and agricultural floor of Imperial County allowing for deposition of particulates onto the air monitors. All monitors measured elevated concentrations on November 25, 2015 but only Brawley and Niland exceeded the NAAQS.

Figure 2-24 includes a 12-hour back-trajectory ending at 1700 PST on November 25, 2015 coincident with the hour when concentrations decreased to moderate levels and when the wind advisories issued by the San Diego NWS expired. Airflow at all heights are distinctly from the west at all monitors. There is less time in which surface level airflow occurs at all sites. This is coincident with the last hour(s) in which wind speeds are elevated at KNJK and KIPL. KNJK began measuring moderate to light winds by 2056 PST while KIPL began measuring moderate to light winds by 1756 PST. With suspended dust from the previous evening, and the transported dust during the morning to afternoon hours of November 25, 2015 all monitors measured elevated concentrations on November 25, 2015 but only Brawley and Niland exceeded the NAAQS. It is of some worth to point out that from time to time modeled winds differ from local conditions. Data used in the HYSPLIT model has a horizontal resolution of 12 km and integrated every three hours. Thus, the HYSPLIT model may differ from local observed surface wind speeds and directions.

FIGURE 2-22
HYSPLIT MODEL ENDING 2300 PST NOVEMBER 24, 2015

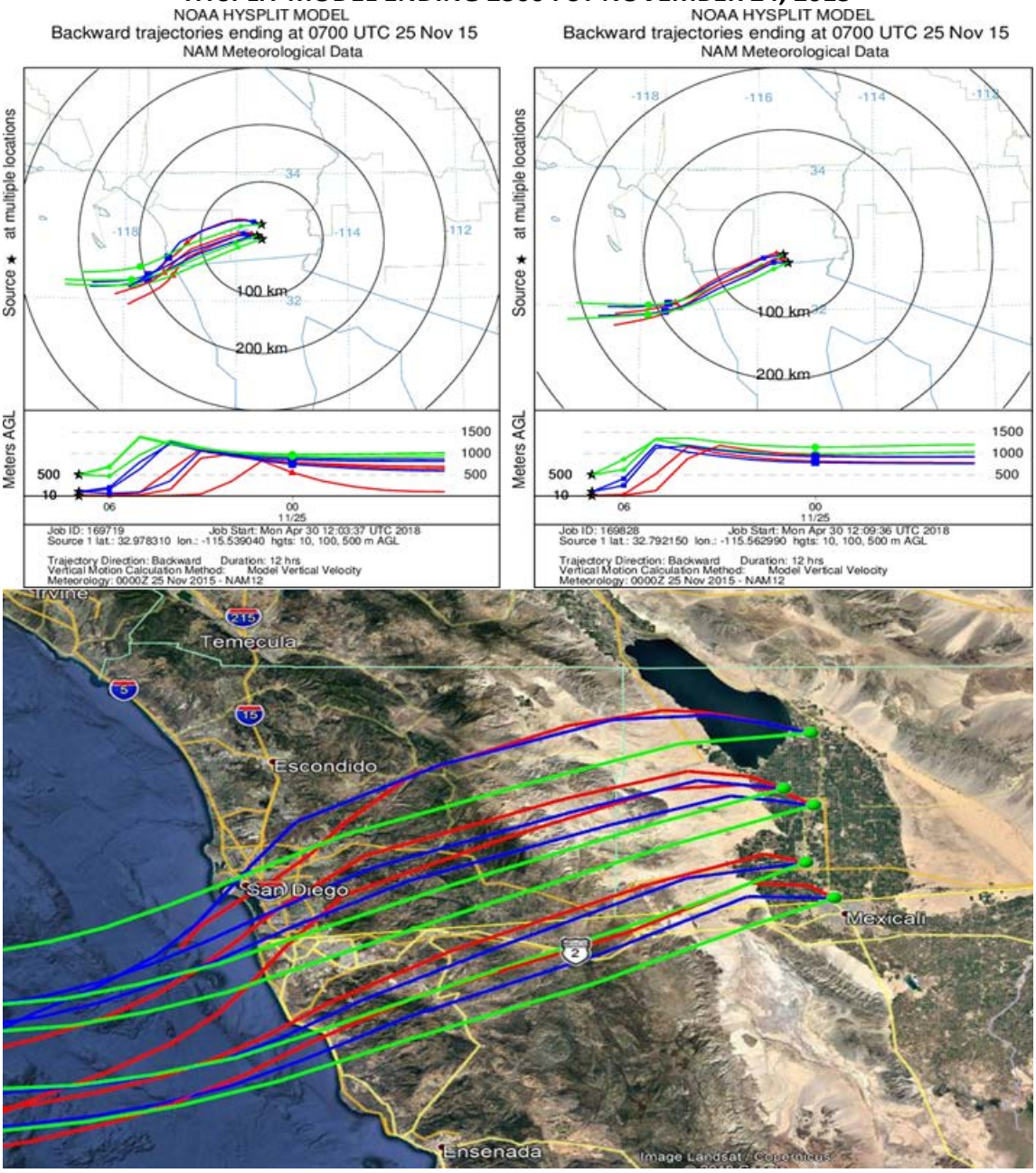


Fig 2-22: A 12-hour back trajectory ending at 2300 PST on November 24, 2015. The top left image included Niland, Brawley and Westmorland and the right top image is El Centro and Calexico. All stations illustrate long enduring surface level west winds leading up to the 2300 hour of November 24, 2015. The bottom image includes all stations depicted on a base map. Red trajectory indicates air flow up to 10 meters AGL (above ground level); blue indicates 100 meters AGL; green indicates 500 meters AGL. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model

FIGURE 2-23
HYSPLIT MODEL ENDING 0900 PST NOVEMBER 25, 2015

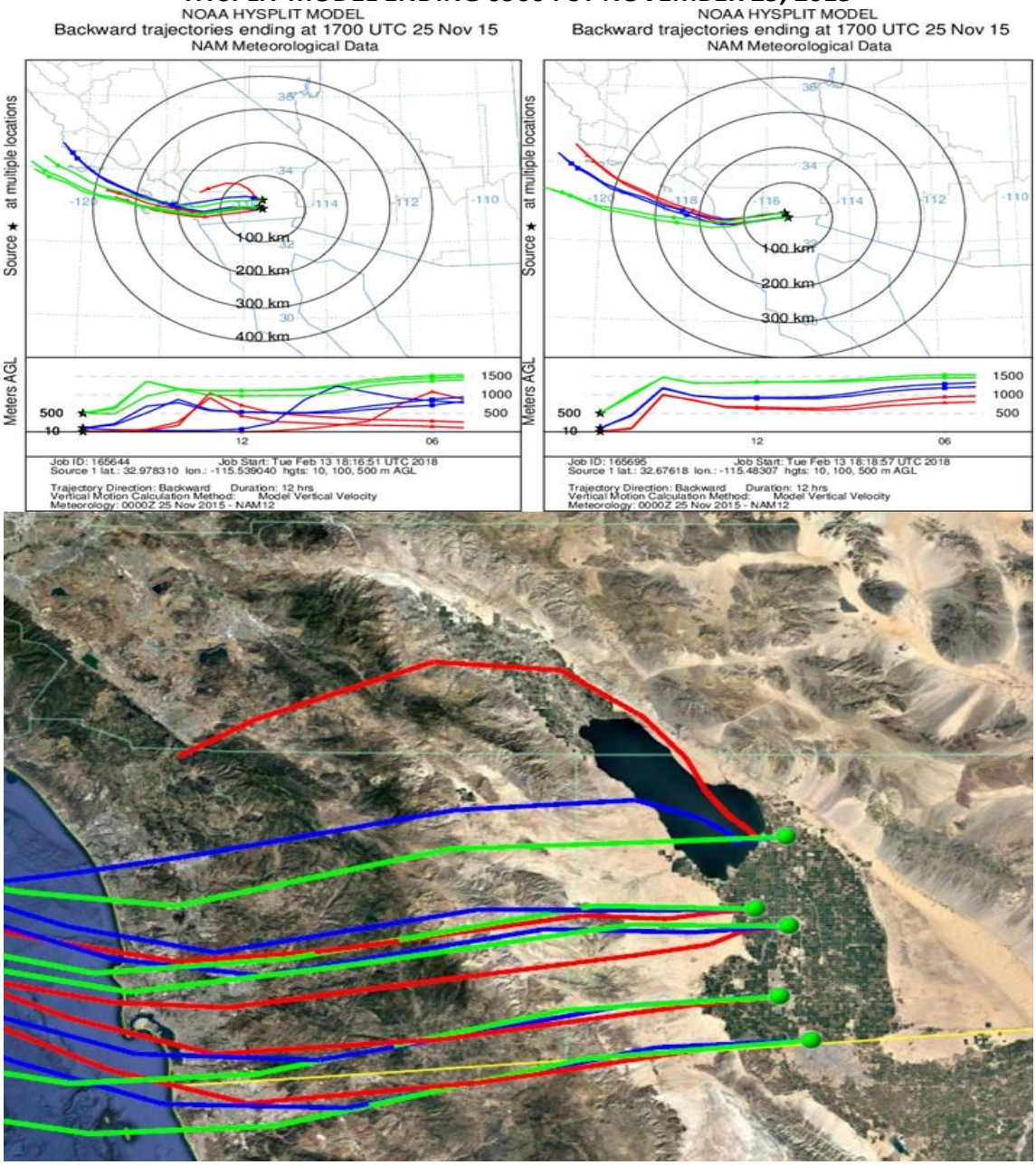


Fig 2-23: A 12-hour back trajectory ending at 0900 PST on November 25, 2015 coincident with peak concentrations at the Brawley monitor. The top left image includes Brawley, Niland and Westmorland and the top right image includes El Centro and Calexico. Unlike the El Centro and Calexico stations, the air monitors located to the north, Brawley, Niland and Westmorland illustrate long surface level west winds. Red trajectory indicates air flow up to 10 meters AGL (above ground level); blue indicates 100 meters AGL; green indicates 500 meters AGL. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model

FIGURE 2-24
HYSPLIT MODEL ENDING 1700 PST NOVEMBER 25, 2015

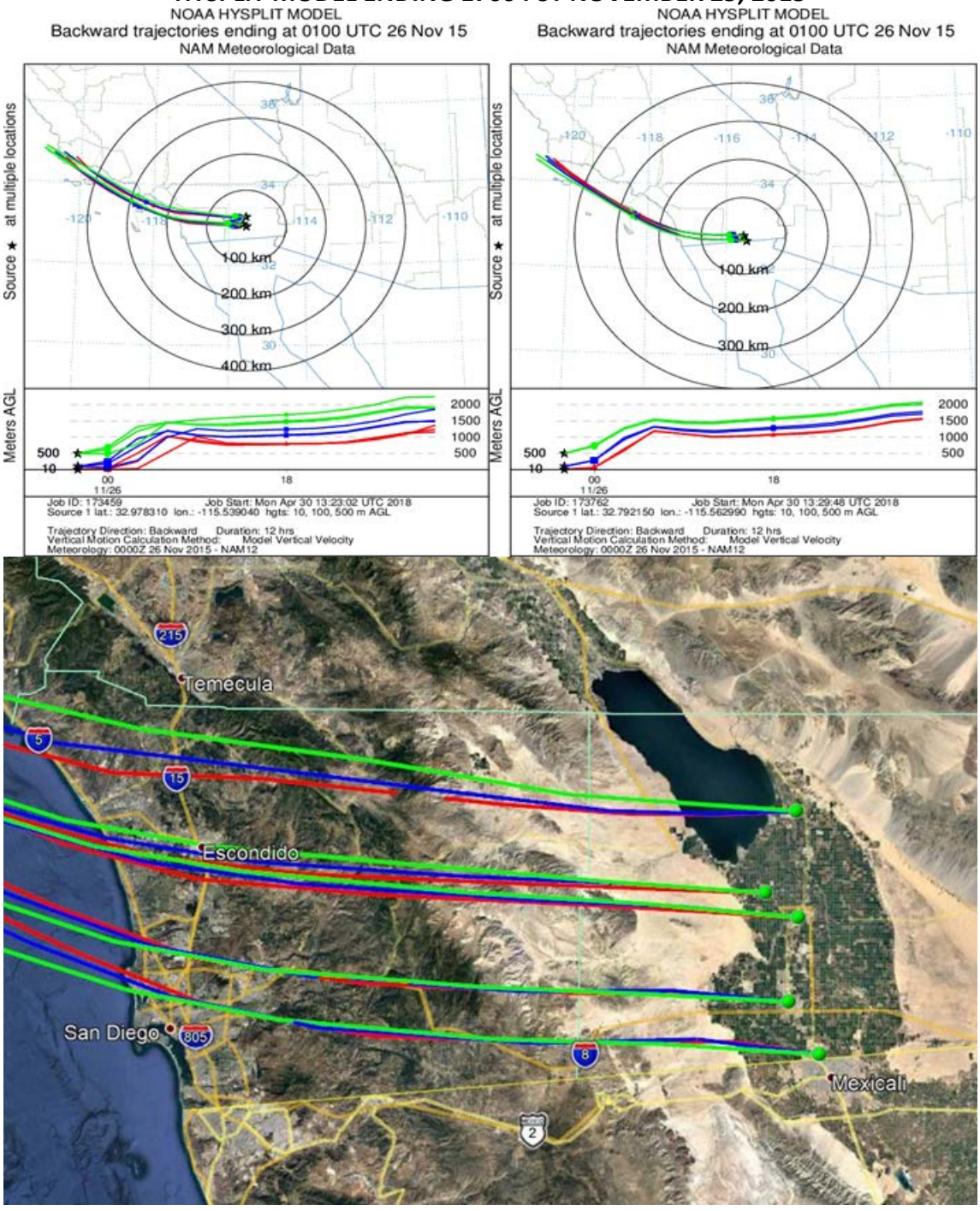


Fig 2-24: A 12-hour back trajectory ending at 1700 PST on November 25, 2015 coincident with the hour when concentrations begin to reduce illustrates shorter surface level, west winds affecting the monitors. Red trajectory indicates airflow up to 10 meters AGL (above ground level); blue indicates 100 meters AGL; green indicates 500 meters AGL. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model

Figures 2-25 and 2-26 illustrate the elevated wind speeds and elevated levels of hourly PM_{10} concentrations measured in Riverside, Imperial and Yuma counties for a total of three days, November 24, 2015 through November 26, 2015. Elevated emissions transported into Imperial County affected the Brawley and Niland monitors when gusty westerly winds, associated with the passage of a low-pressure trough and associated cold front, moved southward through the Western states. The Brawley and Niland monitors measured the highest elevated concentrations between 0800 PST and 1700 PST on November 25, 2015, coincident with continual measured wind speeds at or above 25 mph and wind gusts reaching 53 mph.

The resulting entrained dust and accompanying high winds from the system qualify this event as a "high wind dust event".[7] High wind dust events are considered natural events where the windblown dust is either from solely a natural source or from areas where anthropogenic sources of windblown dust are controlled with Best Available Control Measures (BACM). The following sections provide evidence that the November 25, 2016 high wind event qualifies as a natural event and that BACM was overwhelmed by the suddenness and intensity of the meteorological event.

FIGURE 2-25
72 HOUR PM_{10} WIND SPEEDS AT REGIONAL AIRPORTS

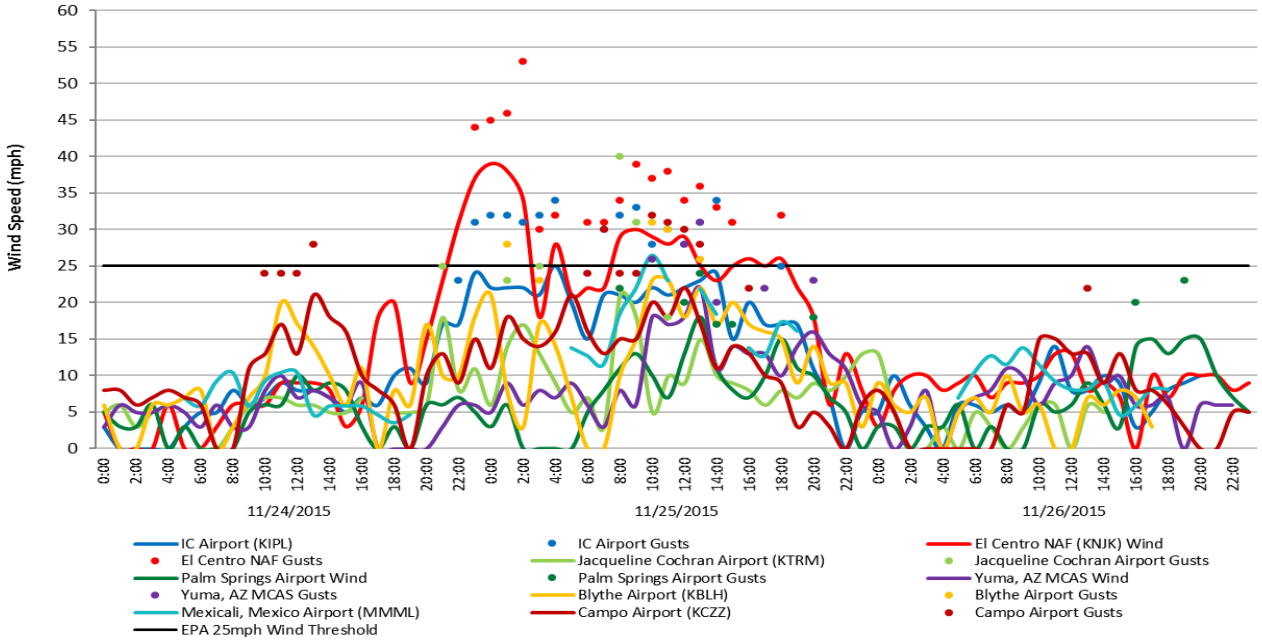


Fig 2-25: Is the graphical representation of the 72-hour wind speeds at various airports throughout Riverside, Imperial and Yuma counties. The graph illustrates the regional effect of the wind event and the number of hours winds measured 25 mph or above. Wind data from the NCEI's QCLCD system.

[7] Title 40 Code of Federal Regulations part 50: §50.1(p) High wind dust event is an event that includes the high-speed wind and the dust that the wind entrains and transports to a monitoring site.

FIGURE 2-26
72 HOUR PM_{10} CONCENTRATIONS NEIGHBORING SITES

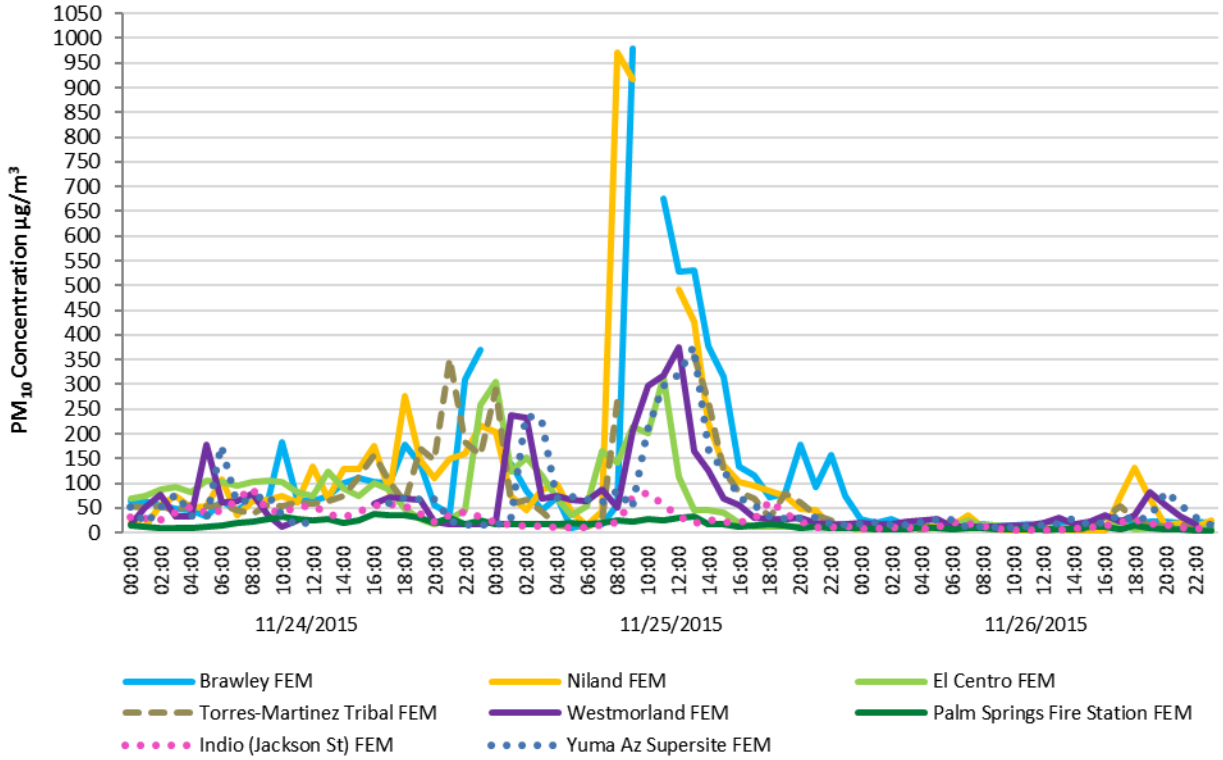


Fig 2-26: Is the graphical representation of the 72-hour relative PM_{10} concentrations at various monitoring locations throughout Riverside, Imperial and Yuma counties. The graph illustrates the regional effect of the wind event. Air quality data from the EPA's AQS data bank

III Historical Concentrations

III.1 Analysis

While naturally occurring high wind events may recur seasonally and at times frequently and qualify for exclusion under the EER, historical comparisons of the particulate concentrations and associated winds provide insight into the frequency of events within an identified area. The following time series plots illustrate that PM_{10} concentrations measured at the Brawley and Niland monitors on November 25, 2015, were compared to non-event and event days demonstrating the variability over several years and seasons. The analysis also provides supporting evidence that there exists a clear causal relationship between the November 25, 2015 high wind event and the exceedance measured at the Brawley and Niland monitors.

Figures 3-1 through 3-6 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley and Niland stations for the period of January 1, 2010 through November 25, 2015. Note that prior to 2013, BAM data was not FEM therefore was not reported into AQS.[8] In order to properly establish the variability of the event as it occurred on November 25, 2015, 24-hour averaged PM_{10} concentrations between January 1, 2010 and November 25, 2015 were compiled and plotted as a time series. All six figures illustrate that the exceedance, which occurred on November 25, 2015, were outside the normal historical concentrations when compared to event and non-event days. Air quality data for all graphs obtained through the EPA's AQS data bank.

[8] Pollutant concentration data contained in EPA's Air Quality System (AQS) are required to be reported in units corrected to standard temperature and pressure (25 C, 760 mm Hg). Because the PM_{10} concentrations prior to 2013 were not reported into the AQS database all BAM (FEM) data prior to 2013 within this report are expressed as micrograms per cubic meter (mg/m3) at local temperature and pressure (LTP) as opposed to standard temperature and pressure (STP, 760 torr and 25 C). The difference in concentration measurements between standard conditions and local conditions is insignificant and does not alter or cause any significant changes in conclusions to comparisons of PM_{10} concentrations to PM_{10} concentrations with in this demonstration.

FIGURE 3-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO NOVEMBER 25, 2015

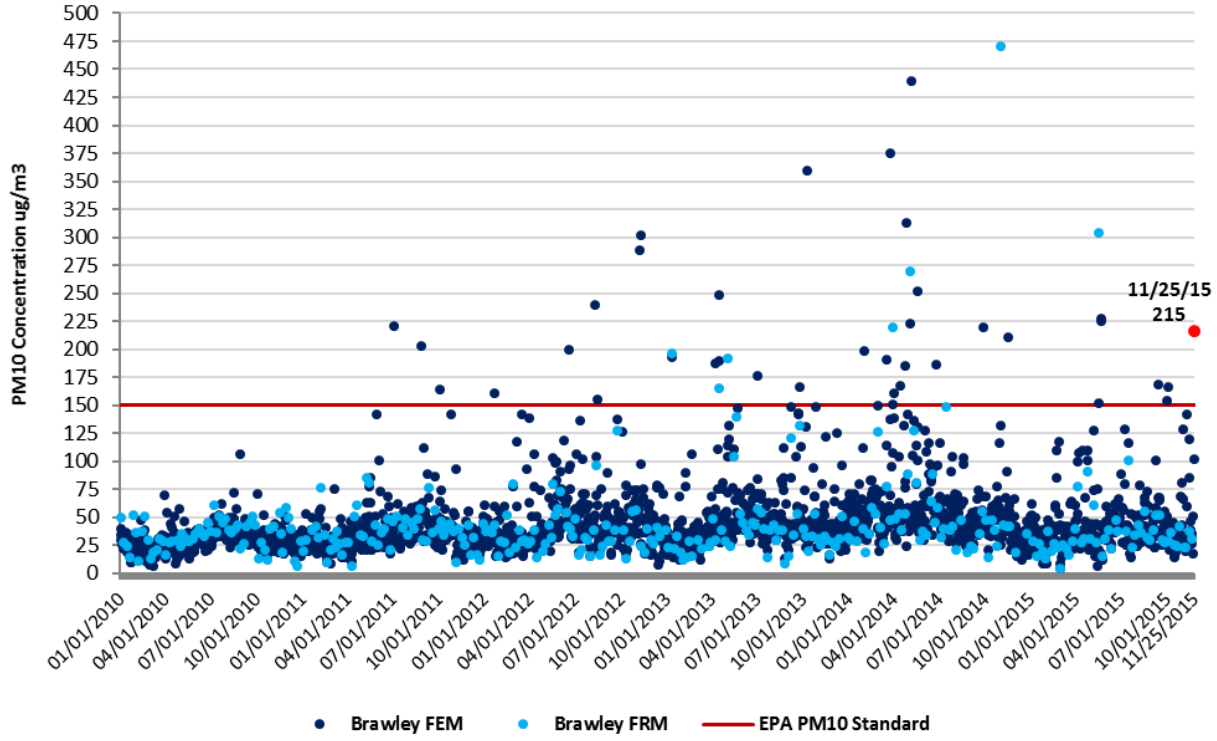


Fig 3-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 215 µg/m^3 on November 25, 2015 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

FIGURE 3-2
NILAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO NOVEMBER 25, 2015

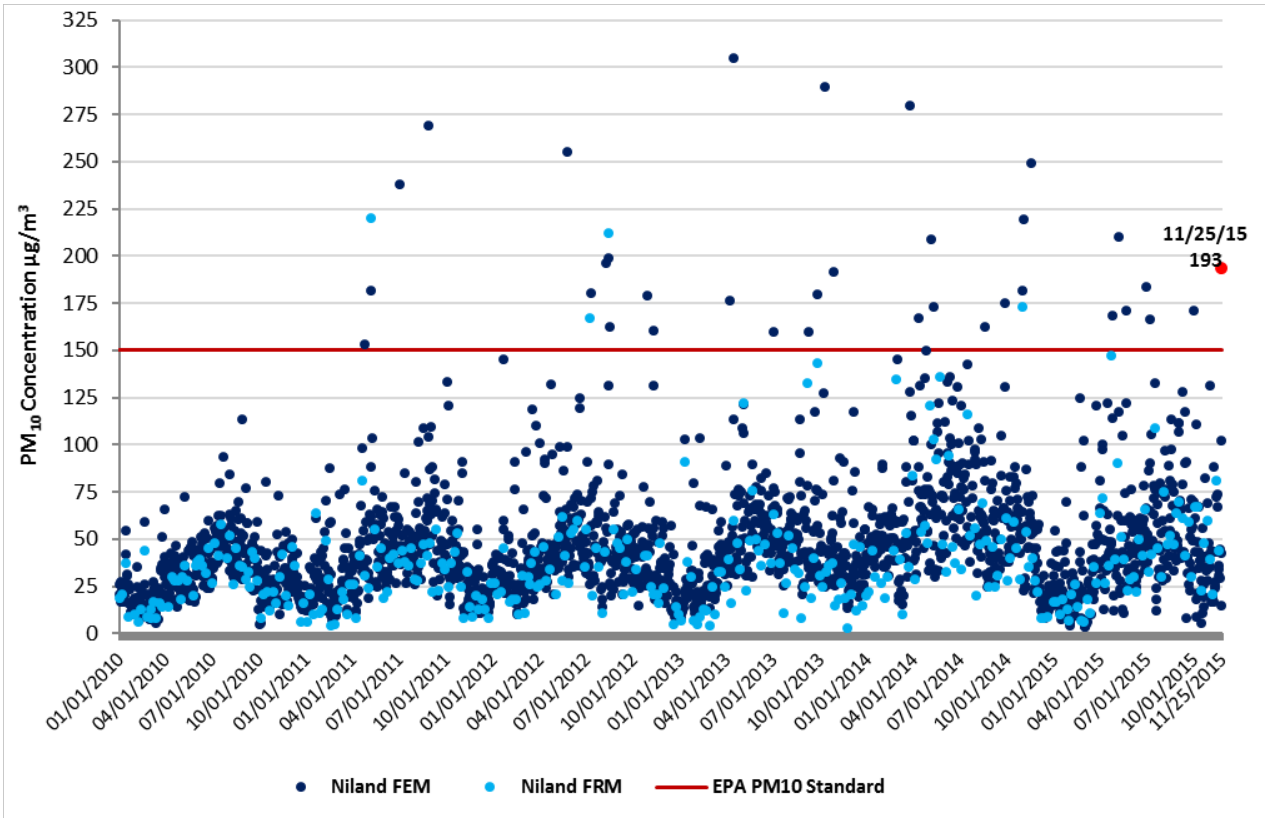


Fig 3-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 193 µg/m^3 on November 25, 2015 by the Niland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

FIGURE 3-3
BRAWLEY AND NILAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO NOVEMBER 25, 2015

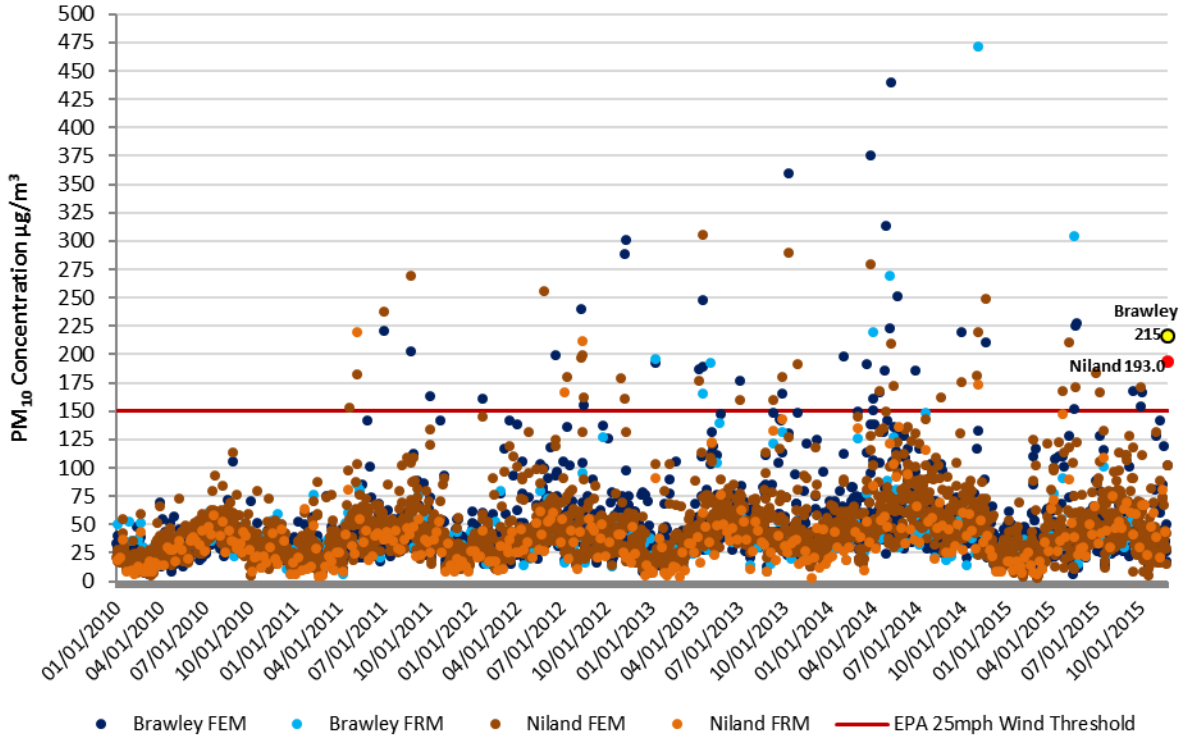


Fig 3-3: A comparison of PM_{10} historical concentrations demonstrates that the measured concentrations of 215 µg/m^3 and 193 µg/m^3 on November 25, 2015 by the Brawley and Niland monitors were outside the normal historical concentrations when compared to similar event days and non-event days

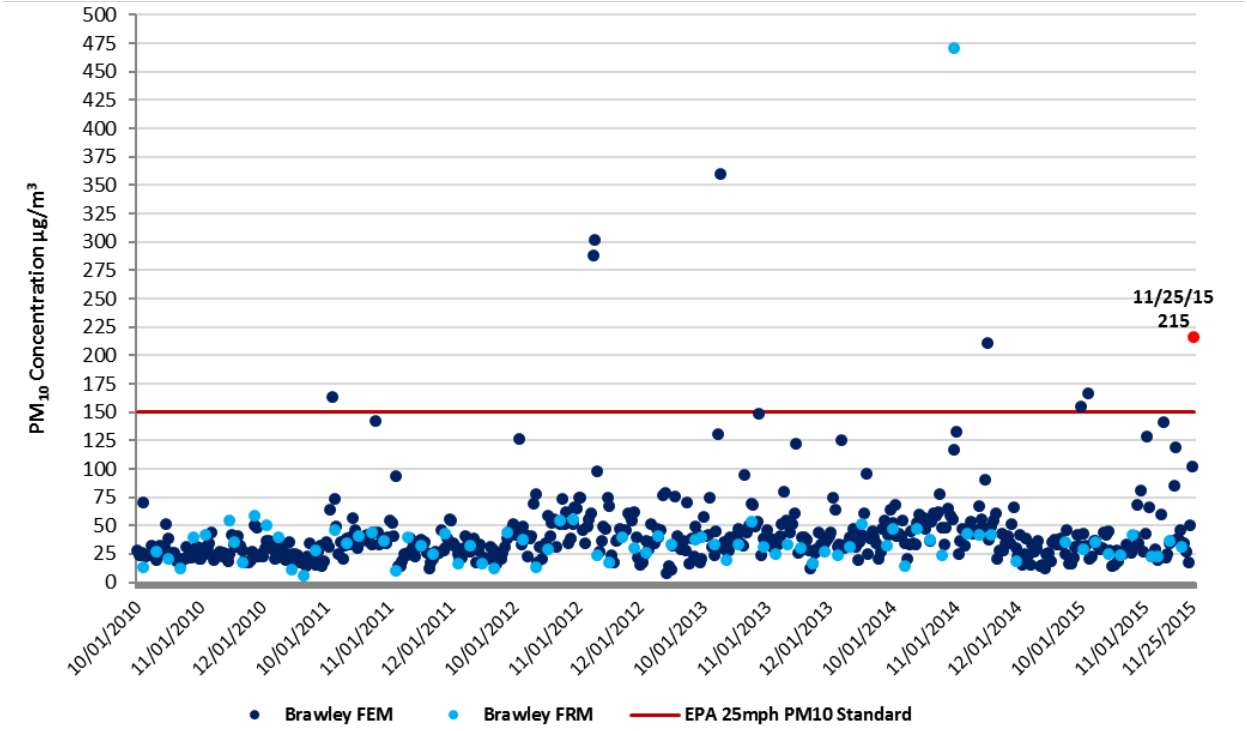
The time series, **Figures 3-1 through 3-3** for Brawley and Niland include 4,988 credible samples, measured by either FRM or FEM monitors between January 1, 2010 and November 2, 2015.

Overall, the time series illustrates that of the 2,155 sampling days 56 exceedance days occurred between January 1, 2010 and November 25, 2015. The quarterly breakdown is as follows: Of the 56 exceedance days, a combined 12 exceedance days occurred during 4th quarter sampling. Of the remaining 44 exceedance days, six (6) exceedance days occurred during 1st quarter, 24 exceedance days occurred during 2nd quarter and 14 exceedance days occurred during 3rd quarter.

The Brawley monitor measured 2,495 credible samples (37 exceedance days) while the Niland monitor measured 2,493 credible samples (36 exceedance days). Combined the monitors measured 4,988 credible samples within 2,155 sampling days. The total 56 exceedance days represents the combined exceedances, per day, measured by each monitor. Thus, historically,

the 56 exceedance days represents a less than a half percent (<0.5%) occurrence rate. When reviewing the individual historical exceedances both monitors measured at a rate less than a 2% occurrence rate.

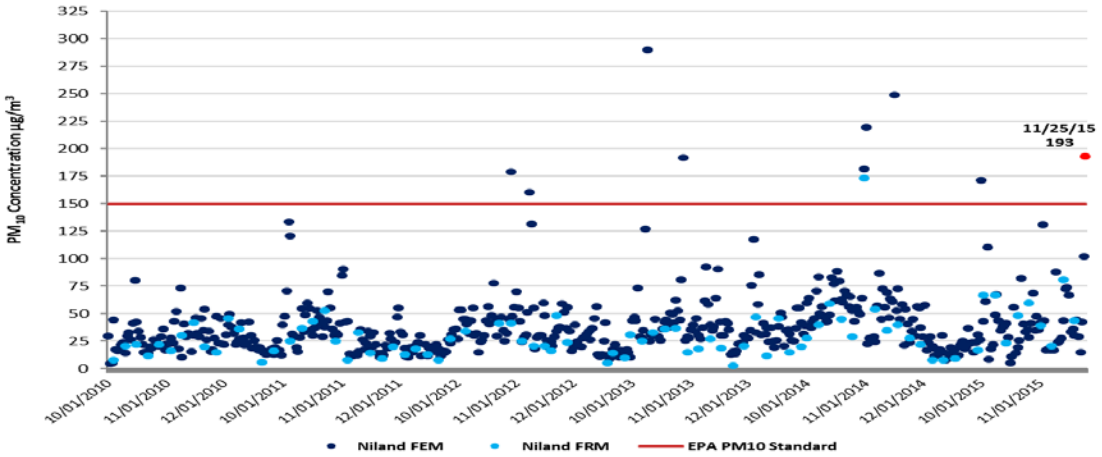
FIGURE 3-4
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 THROUGH NOVEMBER 25, 2015**



***Quarterly: October 1, 2010 through December 31, 2015 and October 1, 2015 through November 25, 2015**

Fig 3-4: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 215 µg/m^3 on November 25, 2015 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

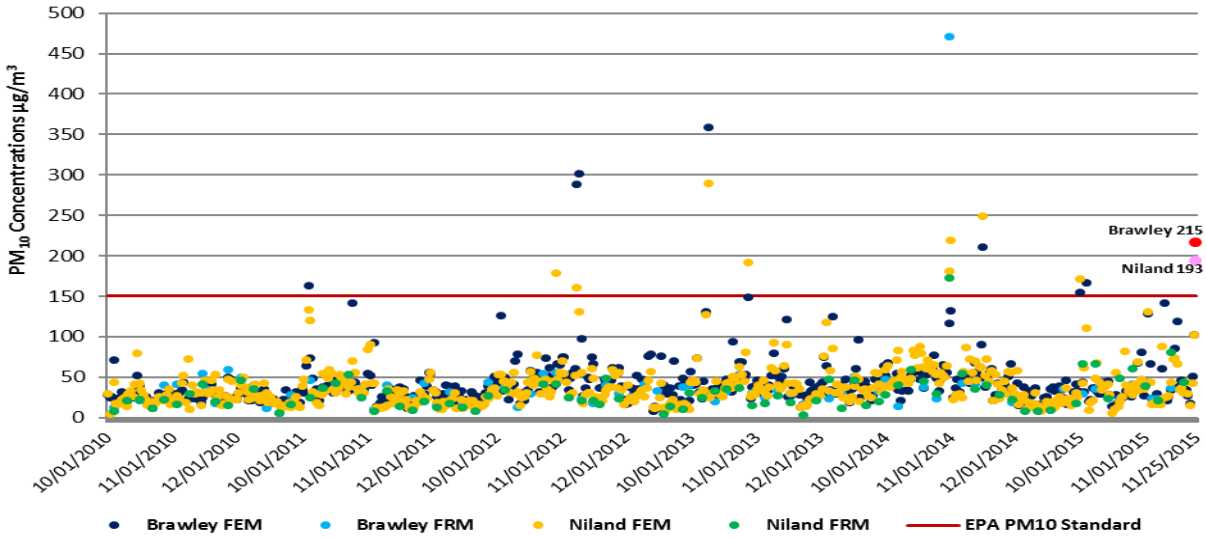
FIGURE 3-5
NILAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 THROUGH NOVEMBER 25, 2015**



***October 1, 2010 through December 31, 2015 and October 1, 2015 through November 25, 2015**

Fig 3-5: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 193 µg/m^3 on November 25, 2015 by the Niland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

FIGURE 3-6
BRAWLEY AND NILAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 THROUGH NOVEMBER 25, 2015**



***October 1, 2010 through December 31, 2015 and October 1, 2015 through November 25, 2015**

Fig 3-6: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentrations of 215 µg/m^3 and 193 µg/m^3 on November 25, 2015 by the Brawley and Niland monitors were outside the normal historical concentrations when compared to similar event days and non-event days

Figures 3-4 through **3-6** for Brawley and Niland illustrate the seasonal pattern for the months October through December for the years 2010 through 2015. The Brawley and Niland monitors measured a combined 1,191 credible samples within 516 sampling days. 12 exceedance days occurred for the seasonal fourth quarters between 2010 and 2015. The occurrence rate is less than 2.5%.

FIGURE 3-7
BRAWLEY AND NILAND HISTORICAL
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
JANUARY 2010 TO NOVEMBER 25, 2015

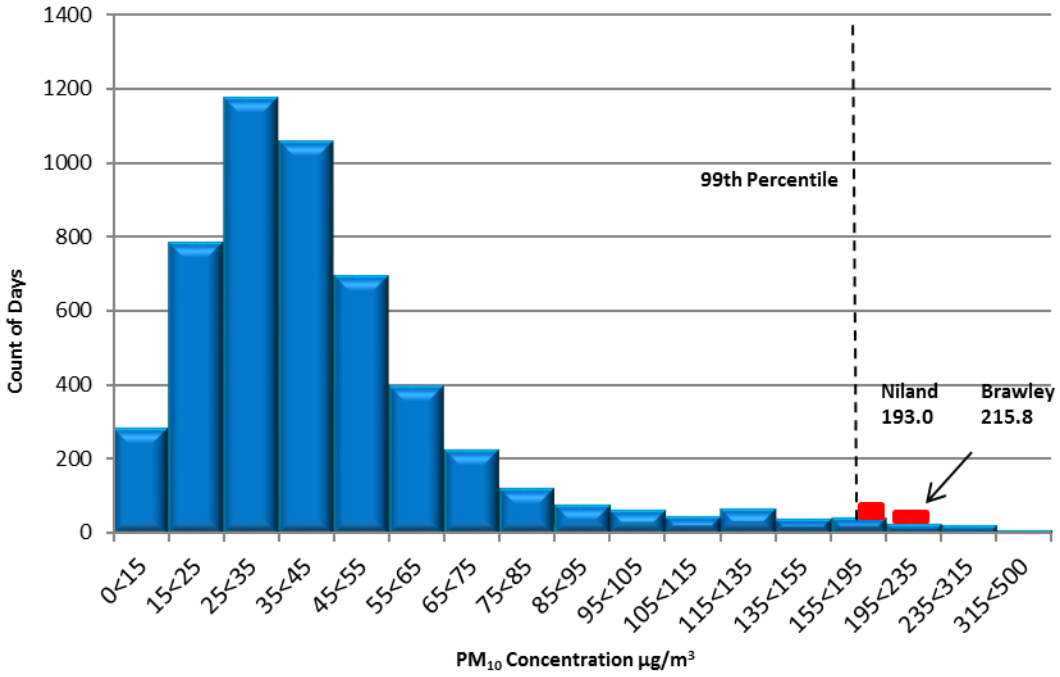
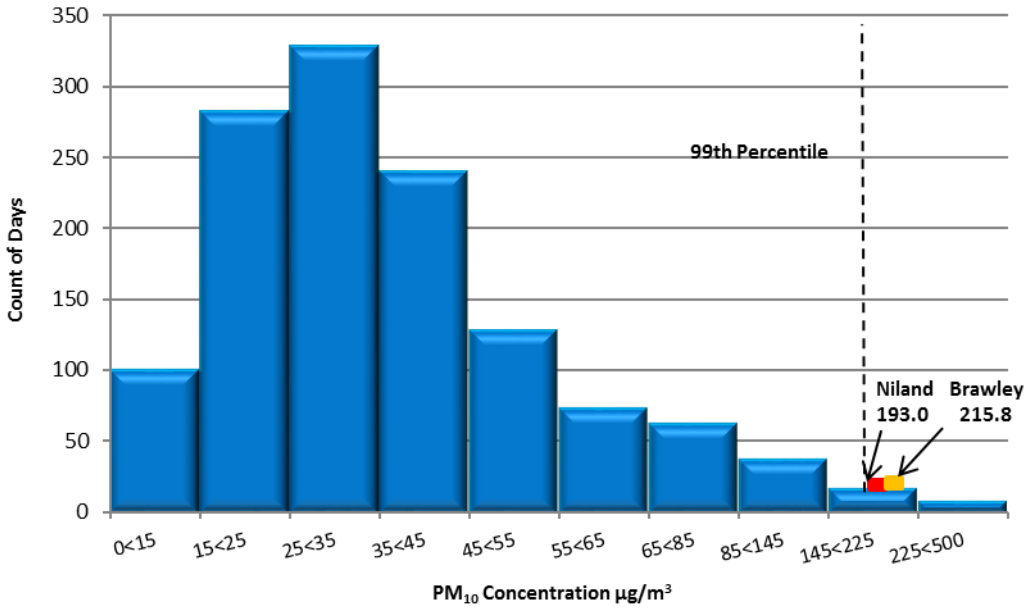


Fig 3-7: The 24-hr average PM_{10} concentrations measured at the Brawley and Niland monitors demonstrates that the November 25, 2015 event was in excess of the 99th percentile.

FIGURE 3-8
BRAWLEY AND NILAND SEASONAL
FRM AND FEM PM_{10} 24 HR AVG CONCENTRATIONS
***OCTOBER 1, 2010 THROUGH NOVEMBER 25, 2015**



***October 1, 2010 through December 31, 2015 and October 1, 2015 through November 25, 2015**

Fig 3-8: The 24-hr average seasonal PM_{10} concentrations at the Brawley and Niland monitors demonstrate that the November 25, 2015 event was in excess of the 99th percentile.

For the combined FRM and FEM annual 2010 through 2014 Brawley and Niland dataset, the concentration of 215 µg/m^3 for Brawley and 193 µg/m^3 for Niland are above the 99th percentile.

For the combined FRM and FEM seasonal historical 2010 through 2015 dataset for Brawley and Niland, the FEM concentrations of 215 µg/m^3 and 193 µg/m^3 for Brawley and Niland, respectively, are above the 99th percentile ranking. As mentioned above FEM BAM data was not considered regulatory from 2010 to 2012. However, this does not materially influence percentile rankings. Looking at the annual time series concentrations, the seasonal time series concentrations, and the percentile rankings, the November 25, 2015 measured exceedances of 215 µg/m^3 and 193 µg/m^3 are clearly in excess of normal historical fluctuations with seasonal exceedances of the NAAQS not occurring frequently.

III.2 Summary

The information provided, above, by the time series plots, seasonal time series plots, and the percentile rankings illustrate that the PM_{10} concentration observed on November 25, 2015 occurs infrequently. When comparing the measured PM_{10} levels on November 25, 2015 and following USEPA EER guidance, this demonstration provides supporting evidence that the measured exceedances measured at the Brawley and Niland monitoring sites were outside the

normal historical and seasonal historical concentration levels.

The historical concentration analysis provided here supports the determination that the November 25, 2015 natural event affected the concentrations levels at the Brawley and Niland monitors causing an exceedance. The concentration analysis further supports that the natural event affected air quality in such a way that there exists a clear causal relationship between the measured exceedances on November 25, 2015 and the natural event, qualifying the natural event as an Exceptional Event.

IV Not Reasonably Controllable or Preventable

According to the October 3, 2016 promulgated revision to the Exceptional Event (EE) rule under 40 CFR §50.14(b)(8) air agencies must address the "not reasonably controllable or preventable" (nRCP) criterion as two prongs. In order to properly address the nRCP criterion the ICAPCD must not only identify the natural and anthropogenic sources of emissions causing and contributing to the monitored exceedance but must identify the relevant State Implementation Plan (SIP) measures and/or other enforceable control measures in place for the identified sources. An effective analysis of the nRCP must include the implementation status of the control measures in order to properly consider the measures as enforceable. USEPA considers control measures enforceable if approved into the SIP within 5 years of an EE demonstration submittal. The identified control measures must address those specific sources that are identified as causing or contributing to a monitored exceedance.

The final EE rule revision explains that an event is considered not reasonably controllable if reasonable measures to control the impact of the event on air quality were applied at the time of the event. Similarly, an event is considered not reasonably preventable if reasonable measures to prevent the event were applied at the time of the event. However, for "high wind events" when PM_{10} concentrations are due to dust raised by high winds from desert areas whose sources are controlled with Best Available Control Measures (BACM) then the event is a "natural event" where human activity plays little or no direct causal role and thus is considered not preventable.

This section begins by providing background information on all SIP and other enforceable control measures in force during the EE for November 25, 2015. In addition, this November 25, 2015 demonstration provides technical and non-technical evidence that strong gusty westerly winds blew across the mountains and deserts within southeastern California and into Imperial County suspending particulate matter affecting the Brawley and Niland monitors on November 25, 2015. This section identifies all natural and anthropogenic sources and provides regulatory evidence of the enforceability of the control measures in place during the November 25, 2015 EE.

IV.1 Background

Inhalable particulate matter (PM_{10}) contributes to effects that are harmful to human health and the environment, including premature mortality, aggravation of respiratory and cardiovascular disease, decreased lung function, visibility impairment, and damage to vegetation and ecosystems. Upon enactment of the 1990 Clean Air Act (CAA) amendments, Imperial County was classified as moderate nonattainment for the PM_{10} NAAQS under CAA sections 107(d)(4)(B) and 188(a). By November 15, 1991, such areas were required to develop and submit State Implementation Plan (SIP) revisions providing for, among other things, implementation of reasonably available control measures (RACM).

Partly to address the RACM requirement, ICAPCD adopted local Regulation VIII rules to control PM_{10} from sources of fugitive dust on October 10, 1994, and revised them on November 25,

1996. USEPA did not act on these versions of the rules with respect to the federally enforceable SIP.

On August 11, 2004, USEPA reclassified Imperial County as a serious nonattainment area for PM_{10}. As a result, CAA section 189(b)(1)(B) required all BACM to be implemented in the area within four years of the effective date of the reclassification, i.e., by September 10, 2008.

On November 8, 2005, partly to address the BACM requirement, ICAPCD revised the Regulation VIII rules to strengthen fugitive dust requirements. On July 8, 2010, USEPA finalized a limited approval of the 2005 version of Regulation VIII, finding that the seven Regulation VIII rules largely fulfilled the relevant CAA requirements. Simultaneously, USEPA also finalized a limited disapproval of several of the rules, identifying specific deficiencies that needed to be addressed to fully demonstrate compliance with CAA requirements regarding BACM and enforceability.

In September 2010, ICAPCD and the California Department of Parks and Recreation (DPR) filed petitions with the Ninth Circuit Federal Court of Appeals for review of USEPA's limited disapproval of the rules. After hearing oral argument on February 15, 2012, the Ninth Circuit directed the parties to consider mediation before rendering a decision on the litigation. On July 27, 2012, ICAPCD, DPR and USEPA reached agreement on a resolution to the dispute which included a set of specific revisions to Regulation VIII. These revisions are reflected in the version of Regulation VIII adopted by ICAPCD on October 16, 2012 and approved by USEPA April 22, 2013. Since 2006 ICAPCD had implemented regulatory measures to control emissions from fugitive dust sources and open burning in Imperial County.

FIGURE 4-1
REGULATION VIII GRAPHIC TIMELINE DEVELOPMENT

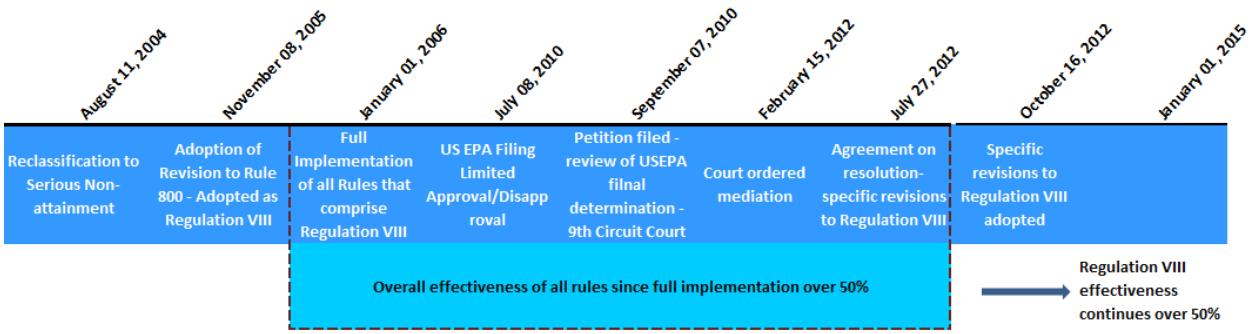


Fig 4-1: Regulation VIII Graphic Timeline

IV.1.a Control Measures

Below is a brief summary of Regulation VIII, which is comprised of seven fugitive dust rules. **Appendix D** contains a complete set of the Regulation VIII rules

ICAPCD's Regulation VIII consists of seven interrelated rules designed to limit emissions of PM_{10}

from anthropogenic fugitive dust sources in Imperial County.

Rule 800, General Requirements for Control of Fine Particulate Matter, provides definitions, a compliance schedule, exemptions and other requirements generally applicable to all seven rules. It requires the United States Bureau of Land Management (BLM), United States Border Patrol (BP) and DPR to submit dust control plans (DCP) to mitigate fugitive dust from areas and/or activities under their control. Appendices A and B within Rule 800 describe methods for determining compliance with opacity and surface stabilization requirements in Rules 801 through 806.

Rule 801, Construction and Earthmoving Activities, establishes a 20% opacity limit and control requirements for construction and earthmoving activities. Affected sources must submit a DCP and comply with other portions of Regulation VIII regarding bulk materials, carry-out and track-out, and paved and unpaved roads. The rule exempts single family homes and waives the 20% opacity limit in winds over 25 mph under certain conditions.

Rule 802, Bulk Materials, establishes a 20% opacity limit and other requirements to control dust from bulk material handling, storage, transport and hauling.

Rule 803, Carry-Out and Track-Out, establishes requirements to prevent and clean-up mud and dirt transported onto paved roads from unpaved roads and areas.

Rule 804, Open Areas, establishes a 20% opacity limit and requires land owners to prevent vehicular trespass and stabilize disturbed soil on open areas larger than 0.5 acres in urban areas, and larger than three acres in rural areas. Agricultural operations are exempted.

Rule 805, Paved and Unpaved Roads, establishes a 20% opacity limit and control requirements for unpaved haul and access roads, canal roads and traffic areas that meet certain size or traffic thresholds. It also prohibits construction of new unpaved roads in certain circumstances. Single-family residences and agricultural operations are exempted.

Rule 806, Conservation Management Practices, requires agricultural operation sites greater than 40 acres to implement at least one conservation management practice (CMP) for each of several activities that often generates dust at agricultural operations. In addition, agricultural operation sites must prepare a CMP plan describing how they comply with Rule 806, and must make the CMP plan available to the ICAPCD upon request.

IV.1.b Additional Measures

Imperial County Natural Events Action Plan (NEAP)

On August 2005, the ICAPCD adopted a NEAP for the Imperial County, as was required under the former USEPA Natural Events Policy, to address PM_{10} events by:

- Protecting public health;
- Educating the public about high wind events;
- Mitigating health impacts on the community during future events; and
- Identifying and implementing BACM measures for anthropogenic sources of windblown dust.

Smoke Management Plan (SMP) Summary

There are 35 Air Pollution Control Districts or Air Quality Management Districts in California which are required to implement a district-wide smoke management program. The regulatory basis for California's Smoke Management Program, codified under Title 17 of the California Code of Regulations is the "Smoke Management Guidelines for Agricultural and Prescribed Burning" (Guidelines). California's 1987 Guidelines revised to improve interagency coordination, avoid smoke episodes, and provide continued public safety while providing adequate opportunity for necessary open burning. The revisions to the 1987 Guidelines approved March 14, 2001. All air districts, with the exception of the San Joaquin Valley Air Pollution Control District (SJAPCD) were required to update their existing rules and Smoke Management Plans to conform to the most recent update to the Guidelines.

Section 80150 of Title 17 specifies the special requirements for open burning in agricultural operations, the growing of crops and the raising of fowl or animals. This section specifically requires the ICAPCD to have rules and regulations that require permits that contain requirements that minimize smoke impacts from agricultural burning.

On a daily basis, the ICAPCD reviews surface meteorological reports from various airport agencies, the NWS, State fire agencies and CARB to help determine whether the day is a burn day. Using a four-quadrant map of Imperial County allowed burns are allocated in such a manner as to assure minimal to no smoke impacts safeguarding the public health. Finally, all permit holders are required to notice and advise members of the public of a potential burn. This noticing requirement is the Good Neighbor Policy. On November 2, 2015 the ICAPCD declared a No Burn day **(Appendix A).** There were no complaints filed for agricultural burning on November 2, 2015.

IV.1.c Review of Source Permitted Inspections and Public Complaints

A query of the ICAPCD permit database was compiled and reviewed for active permitted sources throughout Imperial County and specifically around Niland and Brawley during the November 25, 2015 PM_{10} exceedance. Both permitted and non-permitted sources are required to comply with Regulation VIII requirements that address fugitive dust emissions. The identified permitted sources are Aggregate Products, Inc., US Gypsum Quarry, Imperial Aggregates (Val-Rock, Inc., and Granite Construction), US Gypsum Plaster City, Clean Harbors (Laidlaw Environmental Services), Bullfrog Farms (Dairy), Burrtec Waste Industries, Border Patrol Inspection station, Centinela State Prison, various communications towers not listed and various agricultural operations. Non-permitted sources include the wind farm known as Ocotillo Express, and a solar facility known as CSolar IV West. Finally, the desert regions are under the jurisdiction of the Bureau of Land

Management and the California Department of Parks (Including Anza Borrego State Park and Ocotillo Wells).

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions. There were no complaints filed on November 25, 2015, officially declared as a No Burn day, related to agricultural burning, or waste burning. A filed dust complaint on November 25, 2015 by a resident of the City of El Centro identified dust emissions affecting residents. However, the complaint alleged that the dust emissions that affected the residents occurred the previous day and not on November 25, 2015. Site review and investigation revealed the tilling of a field to the west of the residents. Staff spoke to the personnel at the site and explained the situation. Agricultural personnel applied corrective measures and the ICAPCD did not receive any additional complaints.

FIGURE 4-2
PERMITTED SOURCES

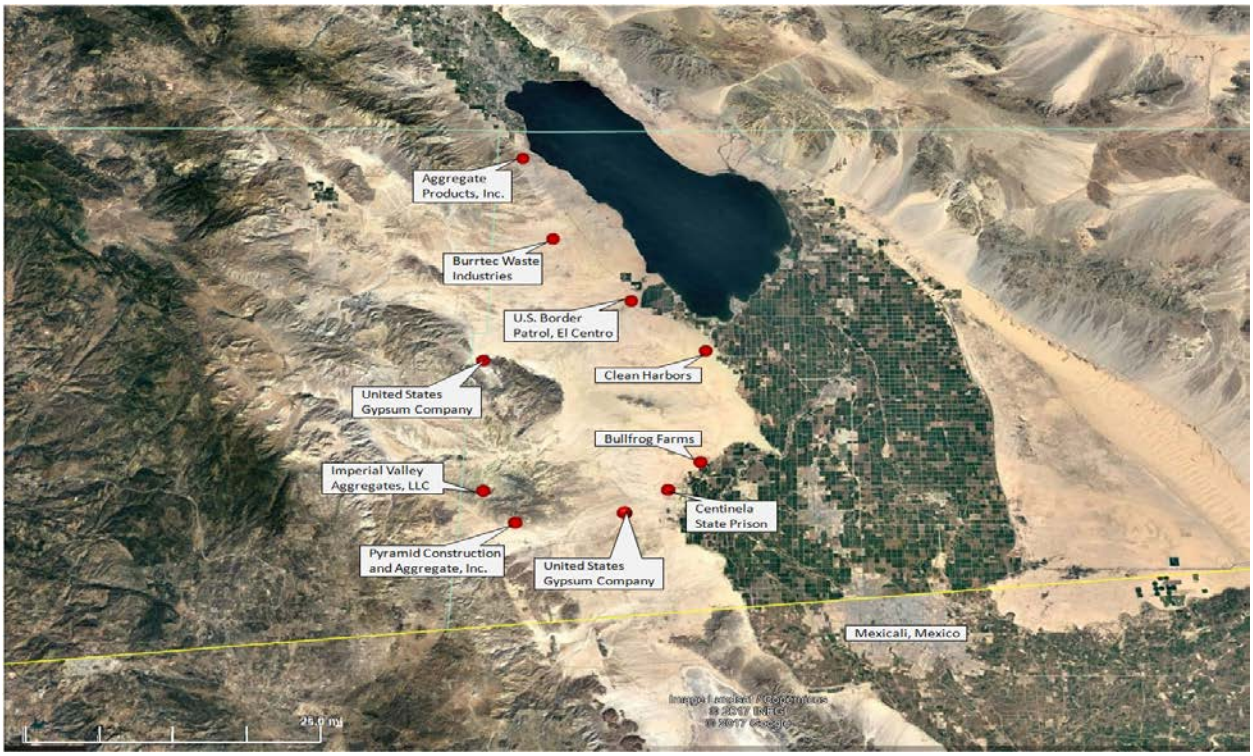


Fig 4-2: The above map identifies those permitted sources located west, northwest and southwest of the Niland and Brawley monitors. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States and Mexico. The green checker-boarded areas are a mixed use of agricultural and community parcels. In addition, either the Bureau of Land Management or the California Department of Parks manages the desert areas. Base map from Google Earth

FIGURE 4-3

NON-PERMITTED SOURCES

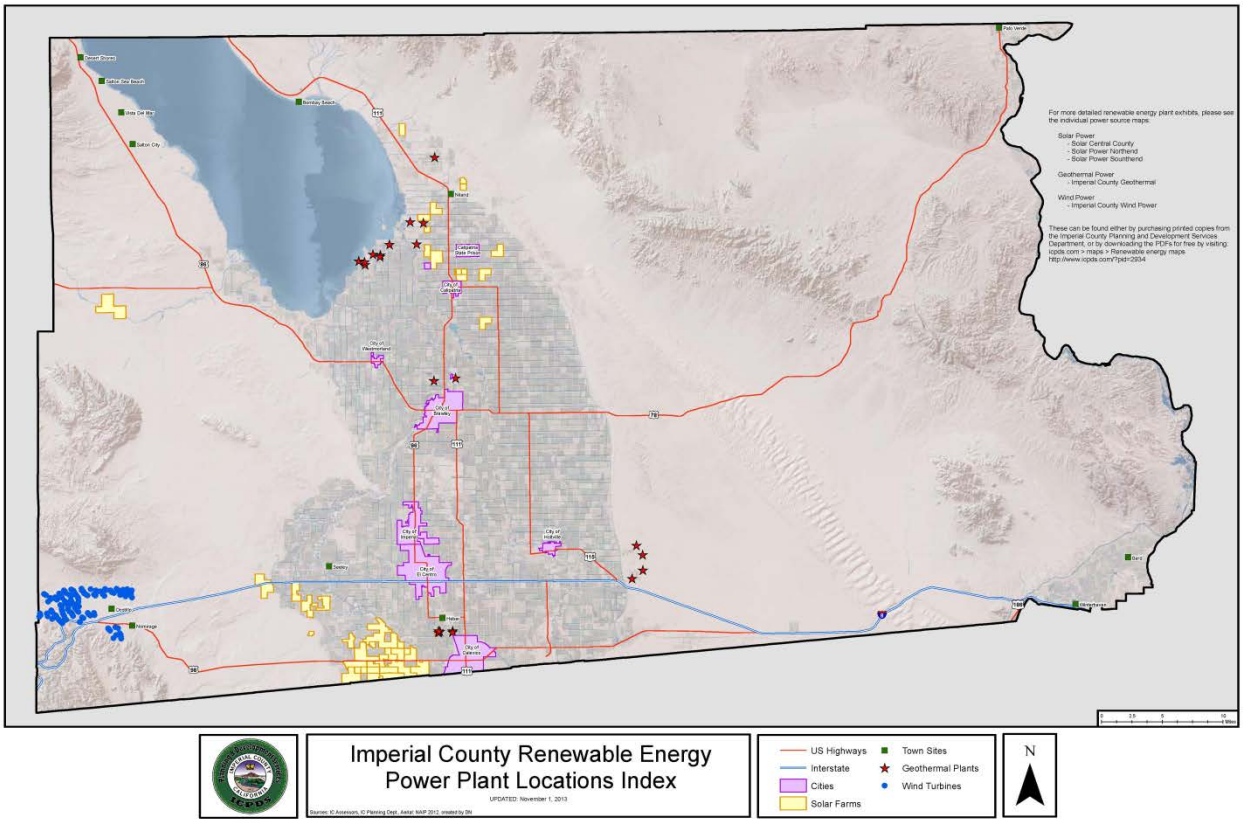


Fig 4-3: The above map identifies those power sources located west, northwest and southwest of the Brawley and Niland monitors. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

IV.2 Forecasts and Warnings

As mentioned above the ICAPCD published the National Weather Service (NWS) forecast synopsis from the San Diego and Phoenix offices. The San Diego office described a low-pressure system over the Great Basin and southwest states. Forecasted cooler temperatures, few periods of light showers and gusty west winds within the mountains and deserts. The Phoenix office described a chilly Pacific weather system moving into the desert southwest bringing cooler temperatures, breezy conditions and a slight chance of mountain showers.

As early as Sunday, November 22, 2015 the San Diego NWS office issued an Area Forecast Discussion, 0908 pm PST that identified the development of a low-pressure over the Great Basin by Wednesday, November 25, 2015. The days leading up to Wednesday, November 25,2015, the San Diego NWS office discussions explained that the strong low, which originated over western British Columbia intensified and moved rapidly south down the west coast Tuesday, November 24, 2015 and Wednesday, November 25, 205. As a result, during the evening hours of Monday, November 23, 2015 the San Diego NWS office issued its first of seven Urgent Weather messages containing wind advisories.

The wind advisories advised of strong and gusty southwest to west winds in the mountains and deserts for late Tuesday, November 24, 2015 through late Wednesday, November 25, 2015. West winds 20 to 30 mph with gusts to 50 mph along mountain ridges, through and below mountain passes and canyons, and along desert slopes.

A Public Information Statement released by the San Diego NWS office at 1057 am PST on Wednesday, November 25, 2015 identified peak wind speeds within the Coachella Valley ranging between 30 mph and 52 mph with Palm Desert measuring 52 mph peak winds. Within the San Diego County deserts peak winds ranged between 34 mph and 48 mph with Borrego Springs measuring 48 mph, Ocotillo Wells 43 mph and In Ko Pah measured 41 mph. Within the San Diego County Mountains peak winds ranged between 30 mph and 68 mph with Volcan Mountain measuring 68 mph, Harrison Peak measured 57 mph, Boulevard West measured 45 mph and Campo measured 31 mph. By 130pm PST, November 25, 2015, the San Diego NWS office reported reduced visibilities within the Coachella Valley to less than a mile due to blowing dust. By 0519 pm PST Wednesday, November 25, 2015, the San Diego NWS office cancelled all wind advisories.

An Air Quality Forecast issued at 9:10 a.m. on November 25, 2015 and posted on the ICAPCD website Stated that "strong and gusty westerly winds…will also generate periods of blowing dust," leading to reduced levels of air quality. **Appendix A** contains copies of notices pertinent to the November 25, 2015 event.

IV.3 Wind Observations

Wind data during the event were available from airports in eastern Riverside County, southeastern San Diego County, southwestern Yuma County (Arizona), northern Mexico, and Imperial County (see **Table 2-2)**. Both airports, the El Centro Naval Air Facility (NAF)(KNJK) and the Imperial County Airport (KIPL), and all the air monitoring stations began measuring elevated wind speeds during the evening hours of November 24, 2015. KNJK and KIPL began measuring elevated winds as early as 1756 pm PST and 1853 pm PST November 24, 2015 through November 25, 2015. KNJK consistently measured higher wind speeds and gusts with 16 hours of winds at or above 25 mph and 17 hours of gusts between 30 mph and 53 mph. KIPL measured one hour at 25 mph and 16 hours of gusts between 25 mph and 34 mph. The wind event, which occurred on November 25, 2015, had measured wind speeds at or above the 25 mph threshold, overcoming the BACM in place.

IV.4 Summary

The weather and air quality forecasts and warnings outlined in this section demonstrate that as onshore flow strengthened across Southern California periods of stronger and gusty southwest to west winds measured along mountain ridge tops and along desert slopes blew into Imperial County causing uncontrollable PM_{10} emissions. The BACM list as part of the control measures in Imperial County for fugitive dust emissions were in place at the time of the event. These control

measures are required for areas designated as "serious" non-attainment for PM_{10}, such as Imperial County. Thus, the BACM in place at the time of the event were beyond reasonable. In addition, surface wind measurements west of the Brawley and Niland monitors during the event were high enough (at or above 25 mph, with wind gusts of 53 mph) that BACM PM_{10} control measures would have been overwhelmed.

Finally, a high wind dust event can be considered as a natural event, even when portions of the wind-driven emissions are anthropogenic, as long as those emissions have a clear causal relationship to the event and were determined to be not reasonably controllable or preventable. This demonstration has shown that the event that occurred on November 25, 2015 was not reasonably controllable or preventable despite the strong and in force BACM within the affected areas in Imperial County. This demonstration has similarly established a clear causal relationship between the exceedances and the high wind event timeline and geographic location. The November 25, 2015 event can be considered an exceptional event under the requirements of the exceptional event rule.

V Clear Causal Relationship

V.1 Discussion

Meteorological observation for November 25, 2015, identified a winter storm over the Pacific Northwest. The cold upper low pressure, situated over the Oregon/California border moved south stalling over the Great Basin Wednesday, November 25, 2015 through Sunday, November 29, 2015. This brought an extended period of cool weather. As the low-pressure moved southward, the onshore flow strengthened across Southern California creating periods of strong gusty southwest to west winds. The gusty westerly winds blew along mountain ridge tops and along desert slopes within San Diego and Riverside Counties and into Imperial County during the afternoon to evening hours of November 24, 2015 through November 25, 2015 affecting air quality and causing an exceedance at the Brawley and Niland monitors.

As discussed above, in the days leading up to Wednesday, November 25, 2015, the San Diego NWS office discussions explained that a strong low, which originated over western British Columbia, intensified and moved rapidly south down the west coast Tuesday, November 24, 2015 and Wednesday, November 25, 205. As the upper low stalled over the Great Basin, an extended period of cool cyclonic flow and below average temperatures affected the region. The trough brought scattered light showers, colder weather and gusty west winds Tuesday night into Wednesday. As a result, the San Diego NWS office issued seven Urgent Weather messages containing wind advisories for late Tuesday, November 24, 2015 through late Wednesday, November 25, 2015. By 0519 pm PST Wednesday, November 25, 2015, the San Diego NWS office cancelled all wind advisories.

Entrained windblown dust from natural areas, particularly from the desert area and anthropogenic sources controlled with BACM, is verified by the meteorological and air quality observations on November 25, 2015. Meteorological data show that these gusty westerly winds blew across the San Diego mountain slopes and natural open deserts were directly responsible for the high PM_{10} concentrations observed in Imperial County on November 25, 2015

Figures 5-1 through 5-6 provide information regarding the incoming clouds, potential dust and the level of aerosols in the air on November 25, 2015.

FIGURE 5-1
TERRA MODIS SATELLITE IMAGE NOVEMBER 25, 2015

Fig 5-1: A Terra MODIS satellite image (~1030) captured clouds and potential transported dust over Imperial County and the Salton Sea on November 25, 2015. Source: MODIS Today

FIGURE 5-2
AQUA MODIS SATELLITE IMAGE NOVEMBER 25, 2015

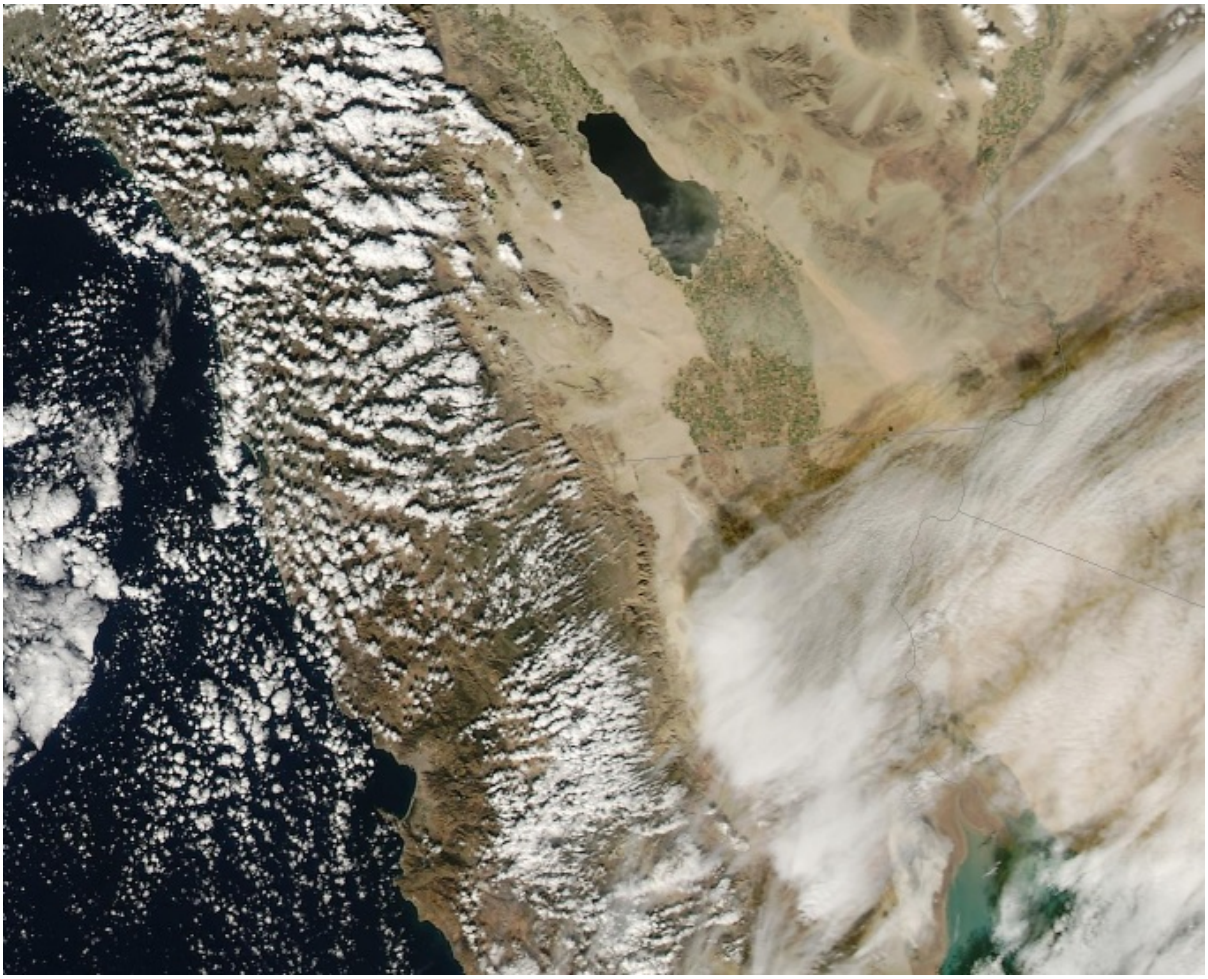


Fig 5-2: The MODIS Aqua satellite image (~1330) captured a potential layer of dust over Imperial County November 25, 2015. Image courtesy of MODIS Today

Figure 5-3 shows the Deep Blue[9] Aerosol Optical Depth (AOD)[10] over Imperial County on November 25, 2015 as captured by the MODIS instrument onboard the Terra satellites. Moderate to thick patches of columns of aerosols can be seen over Imperial County. The image was captured at ~1030 PST, shortly after Brawley and Niland measured peak 24-hour PM_{10} concentrations.

[9] The **Deep Blue Aerosol Optical Depth** layer is useful for studying aerosol optical depth over land surfaces. This layer is created from the Deep Blue (DB) algorithm, originally developed for retrieving over desert/arid land (bright in the visible wavelengths) where Dark Target approaches fail. Source: https://worldview.earthdata.nasa.gov

[10] **Aerosol Optical Depth** (AOD) (or Aerosol Optical Thickness) indicates the level at which particles in the air (aerosols) prevent light from traveling through the atmosphere. Aerosols scatter and absorb incoming sunlight, which reduces visibility. From an observer on the ground, an AOD of less than 0.1 is "clean" - characteristic of clear blue sky, bright sun and maximum visibility. As AOD increases to 0.5, 1.0, and greater than 3.0, aerosols become so dense that sun is obscured. Sources of aerosols include pollution from factories, smoke from fires, dust from dust storms, sea salt, and volcanic ash and smog. Aerosols compromise human health when inhaled by people, particularly those with asthma or other respiratory illnesses. Source: https://worldview.earthdata.nasa.gov

FIGURE 5-3
HEAVY AEROSOLS OVER IMPERIAL COUNTY TERRA SATELLITE

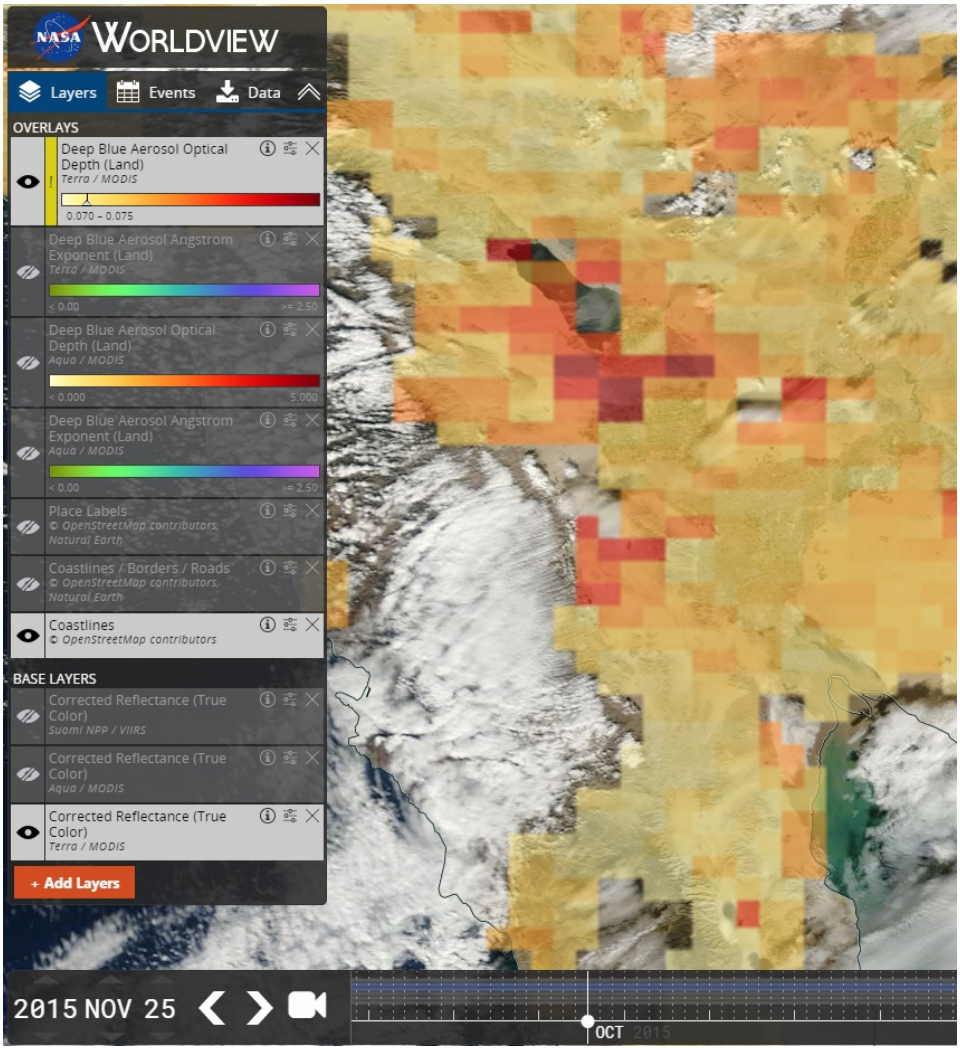


Fig 5-3: The MODIS instrument onboard the Terra satellite captured moderate to heavy aerosols over Imperial County during the period that monitors measured elevated levels of PM_{10}. Darker colors indicated heavier AOD. Source: https://worldview.earthdata.nasa.gov/

Figure 5-4 uses the Deep Blue Angstrom Exponent[11] layer to differentiate the relative particle sizes of aerosols. This is useful in determining what aerosols are likely dust. This image was also captured at ~1030 PST.

[11] The MODIS **Deep Blue Aerosol Ångström Exponent** layer can be used to provide additional information related to the aerosol particle size over land. This layer is created from the Deep Blue (DB) algorithm, originally developed for retrieving over desert/arid land (bright in the visible wavelengths). The Ångström exponent provides additional information on the particle size (larger the exponent, the smaller the particle size). Values < 1 suggest optical dominance of coarse particles (e.g. dust) and values > 1 suggest optical dominance of fine particles (e.g. smoke). Source: https://worldview.earthdata.nasa.gov.

FIGURE 5-4
DUST SIZED AEROSOLS OVER IMPERIAL COUNTY TERRA SATELLITE

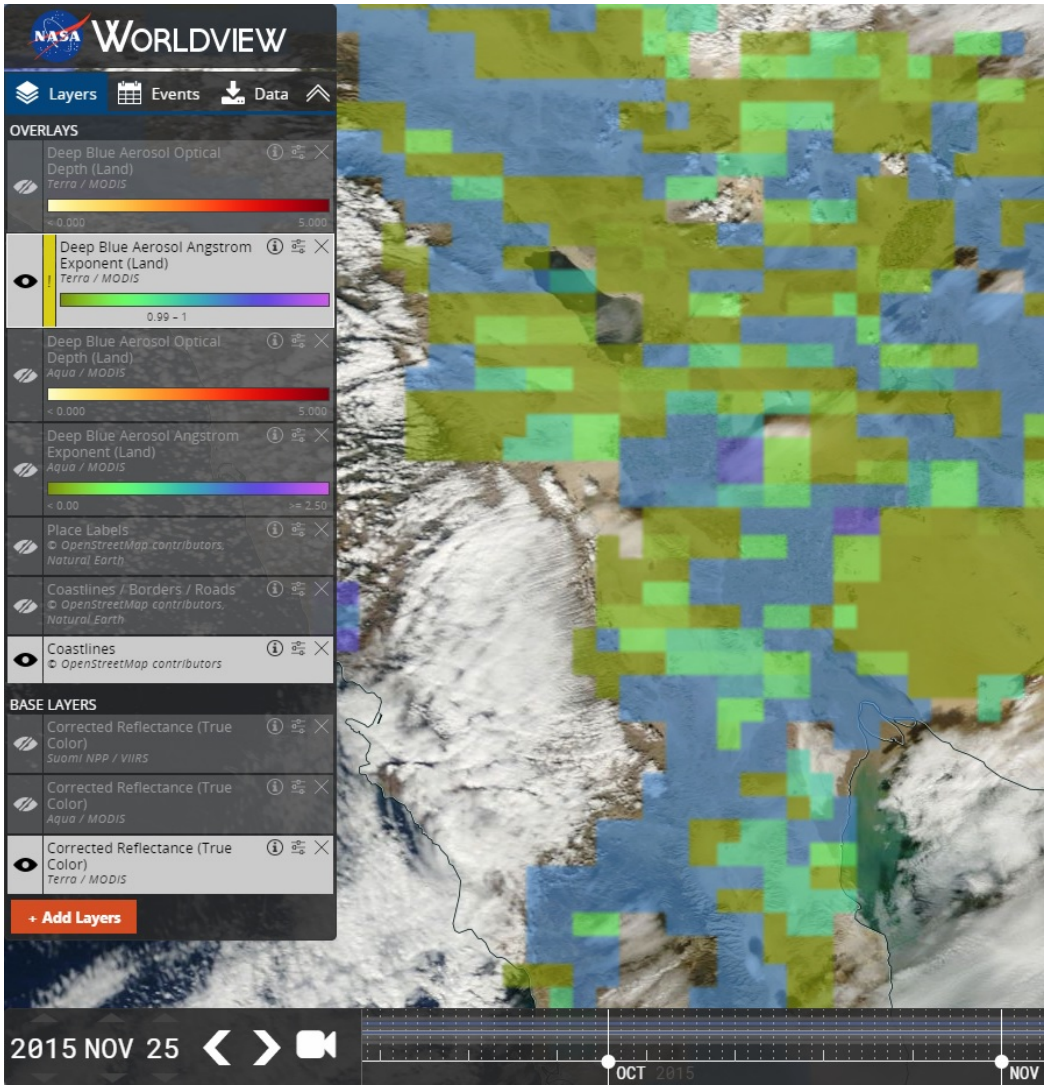


Fig 5-4: Large amounts of transported dust-sized aerosols are visible across Imperial County ~1030 PST. Increasingly darker shades of green indicate increasingly heavier layers of aerosols. See legend on left of image. Source: https://worldview.earthdata.nasa.gov/

Figure 5-5 depicts the AOD as captured by the Aqua satellite at 1330 PST. Although this was after the period of peak 24-hour concentrations, good amounts of transported aerosols are present across Imperial County.

FIGURE 5-5
HEAVY AEROSOLS OVER IMPERIAL COUNTY AQUA SATELLITE

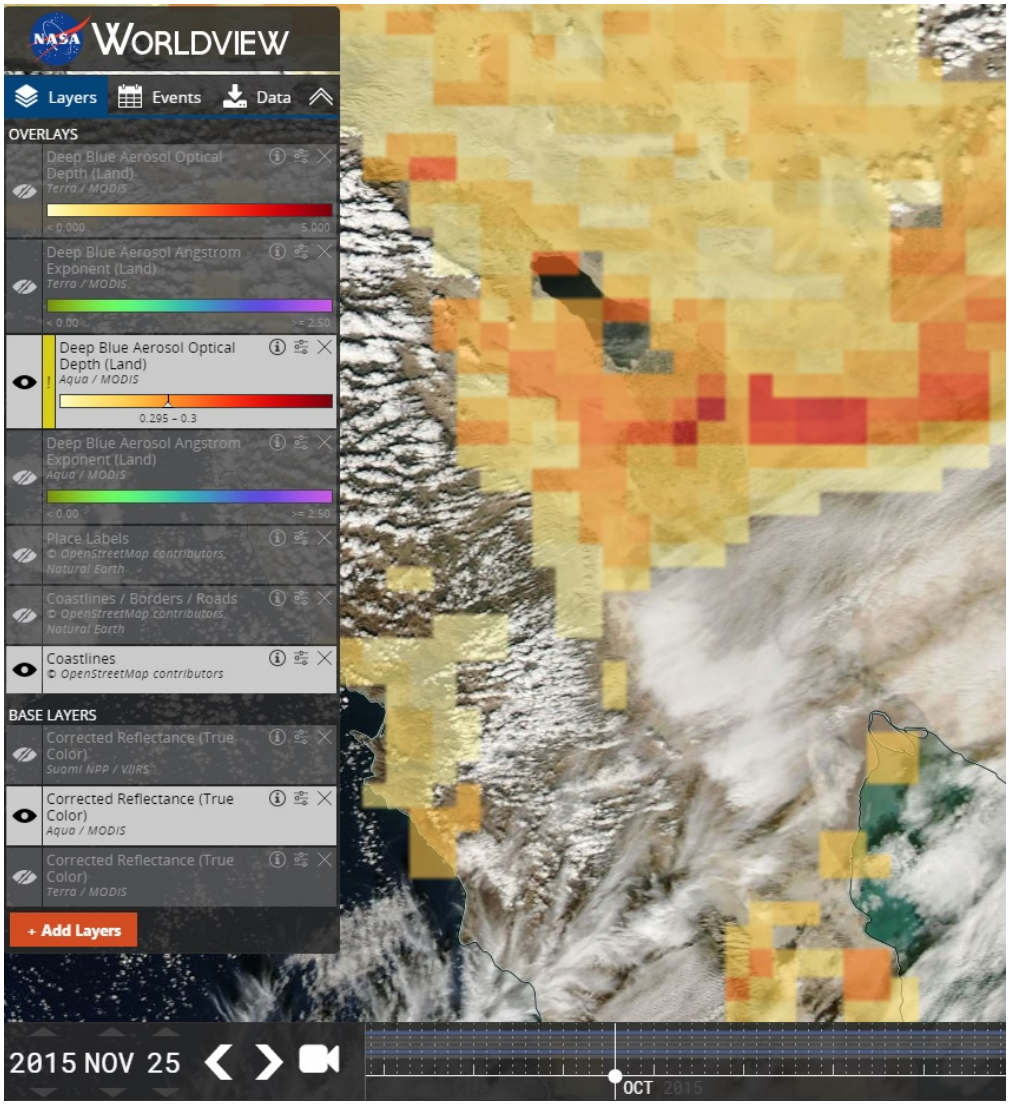


Fig 5-5: The MODIS instrument onboard the Aqua satellite captured moderate to heavy aerosols over Imperial County hours after peak concentrations. Darker colors indicated heavier AOD. Source: https://worldview.earthdata.nasa.gov/

FIGURE 5-6
HEAVY AEROSOLS OVER IMPERIAL COUNTY AQUA SATELLITE

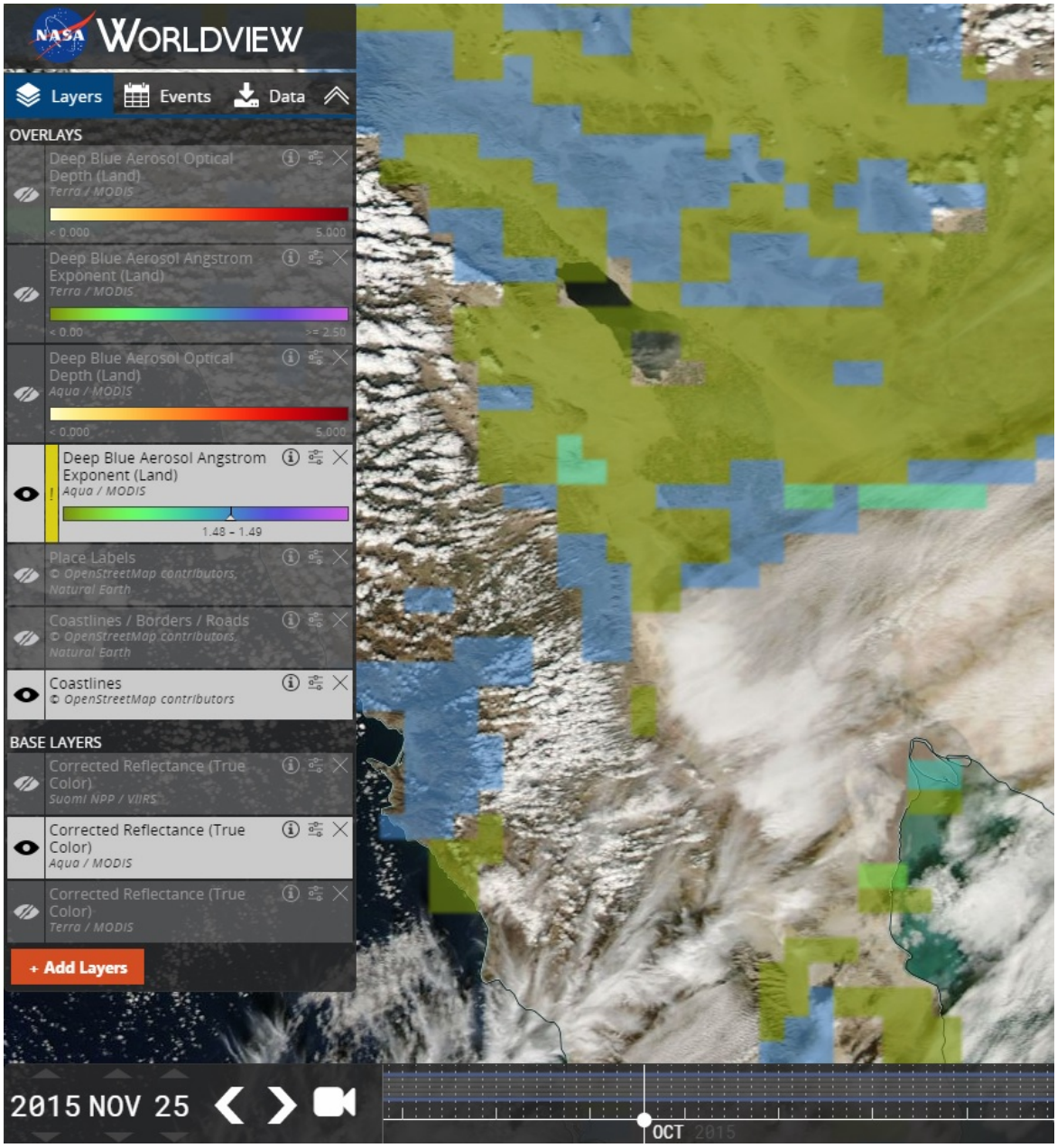


Fig 5-6: The MODIS instrument onboard the Aqua satellite captured moderate to heavy aerosols over Imperial County hours after peak concentrations. Darker colors indicated heavier AOD. Source: https://worldview.earthdata.nasa.gov/

NOAA's smoke/dust text narrative further supports the observed possible dust in **Figures 5-3 through 5-6.** The smoke/dust narrative, valid through 1900 PST, describes an area of blowing dust moving eastward through southern California near the Salton Sea and extending into southwestern Arizona near Yuma. The dust is identified as originating from the Anza-Borrego Desert.

The EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states.[12] **Tables 5-1 and 5-2** provide a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at Brawley and Niland. The hourly concentrations of the FEM monitor are shown in the table. The Brawley and Niland monitors show peak hourly concentrations following or during the period of high upstream wind speeds.

TABLE 5-1
WIND SPEEDS AND PM_{10} CONCENTRATIONS FOR BRAWLEY NOVEMBER 25, 2015

	El Centro NAF (KNJK)			Imperial Co. Airport (KIPL)			Fish Creek Mtns. (FHCC1)			Ocotillo Wells (AS398/KD6RSQ5)			Borrego Springs (BRGSD)			Brawley
HOUR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	PM_{10} ($\mu g/m^3$)
0:00	39	45	260	22	32	260	3	8	302	16	32	299	4	14	189	
1:00	38	46	260	22	32	270	1	7	317	13	24	284	4	7	63	139
2:00	34	53	240	22	31	280	2	8	240	12	30	313	6	8	103	85
3:00	18	30	230	21	32	290	6	15	26	12	20	310	3	6	51	45
4:00	28	32	250	25	34	240	7	23	274	11	25	309	7	12	112	71
5:00	21		230	20		240	0	12		18	35	305	3	7	41	10
6:00	22	31	250	15		240	2	8	170	22	35	303	7	12	329	16
7:00	22	31	240	21	30	250	2	11	295	24	42	309	7	17	297	18
8:00	29	34	230	21	32	260	4	22	357	24	43	316	13	22	301	55
9:00	30	39	220	20	33	230	8	17	106	24	41	327	11	24	274	978
10:00	29	37	230	22	28	250	8	26	171	20	37	300	15	21	305	
11:00	28	38	240	21	30	260	10	25	281	19	41	305	11	22	320	675
12:00	29	34	240	22	28	250	10	22	225	19	35	292	17	30	276	529
13:00	25	36	240	23	31	250	9	30	247	29	28	320	15	21	293	530
14:00	23	33	250	24	34	250	7	27	298	17	27	320	20	30	296	378
15:00	25	31	250	15		250	16	26	256	14	27	307	14	21	309	315
16:00	26		250	20		250	19	29	259	14	24	307	14	19	297	135
17:00	25		250	17		260	16	30	265	13	28	309	12	20	292	115
18:00	26	32	260	17	25	250	19	33	272	14	25	293	5	10	285	72
19:00	22		260	17		250	8	28	301	14	25	305	1	4	113	80
20:00	18		250	11		250	12	23	273	14	26	317	3	7	345	177
21:00	6		260	7		250	10	28	321	13	22	312	8	13	357	93
22:00	13		260	0		0	7	23	324	13	21	340	11	17	345	158
23:00	8		310	5		10	3	17	303	15	24	327	9	16	348	73

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Ocotillo Wells, Fish Creek Mountains, and Borrego Springs from the University of Utah's MesoWest system. Wind speeds = mph; Direction = degrees. Due to the various times that air quality and wind data is sampled during the hour, the hour represents the hour in which the measurement was taken, and not necessarily the exact time

[12] "Treatment of Data Influenced by Exceptional Events; Final Guidance", FR Vol. 81, No. 191, 68279, October 3, 2016

TABLE 5-2
WIND SPEEDS AND PM_{10} CONCENTRATIONS FOR NILAND NOVEMBER 25, 2015

	Naval Test Base		Bombay Beach		El Centro NAF (KNJK)			Imperial Co. Airport (KIPL)			Niland		Niland
HOUR	W/S	W/D	W/S	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/D	PM_{10} (µg/m³)
0:00	5	233	11	281	39	45	260	22	32	260	6	85	204
1:00	3	328	13	264	38	46	260	22	32	270	7	82	75
2:00	1	284			34	53	240	22	31	280	6	84	47
3:00	3	216	15	261	18	30	230	21	32	290	4	104	88
4:00	1	237	5	238	28	32	250	25	34	240	3	104	97
5:00	1	23	8	233	21		230	20		240	2	126	42
6:00	3	347	15	225	22	31	250	15		240	2	119	14
7:00	2	8	20	217	22	31	240	21	30	250	1	278	43
8:00	1	58	29	244	29	34	230	21	32	260	4	167	972
9:00	3	116	32	239	30	39	220	20	33	230	10	149	917
10:00	3	95	21	249	29	37	230	22	28	250	10	150	
11:00	4	75	17	250	28	38	240	21	30	260	9	145	
12:00	7	124	12	286	29	34	240	22	28	250	6	145	492
13:00	9	140	8	268	25	36	240	23	31	250	7	152	426
14:00	9	129	8	255	23	33	250	24	34	250	5	161	223
15:00	5	133	8	259	25	31	250	15		250	7	155	136
16:00	2	183	9	277	26		250	20		250	6	136	102
17:00	8	250	17	256	25		250	17		260	2	83	96
18:00	13	278	19	262	26	32	260	17	25	250	9	226	84
19:00	11	277	11	297	22		260	17		250	7	228	73
20:00	10	266	8	290	18		250	11		250	9	226	48
21:00			8	297	6		260	7		250	10	232	45
22:00			10	294	13		260	0		0	11	253	12
23:00	22	274	10	301	8		310	5		10	15	255	11

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Bombay Beach and the (former) Naval Test Base is from AQMIS2. Niland wind data is from the EPA's AQS data bank. Niland does not measure wind gusts. Wind speeds = mph; Direction = degrees. Due to the various times that air quality and wind data is sampled during the hour, the hour represents the hour in which the measurement was taken, and not necessarily the exact time

The meteorological analysis indicates that the duration of the winds at surface levels played a significant role in transporting dust from the mountains and deserts within San Diego County into Imperial County affecting air quality and causing an exceedance at the Brawley and Niland monitors.

As discussed previously, the San Diego NWS office released a Public Information Statement identifying peak wind speeds within the Coachella Valley, the San Diego County deserts and the San Diego County Mountains peaking well above 25 mph. Locally, the El Centro NAF (KNJK)

consistently measured higher wind speeds and gusts with 16 hours of winds at or above 25 mph and 17 hours of gusts between 30 mph and 53 mph. The Imperial County Airport (KIPL) measured one hour at 25 mph and 16 hours of gusts between 25 mph and 34 mph. The air monitoring stations all measured moderate level winds with Niland measuring the highest moderate level winds, coincident with elevated concentrations of PM_{10}. By 0800 am PST, November 25, 2015 the Niland site measured 15 hours of consistently elevated winds with four hours at or above 25 mph, coincident with measured peak concentrations of PM_{10}.

As discussed above, the cold front and initial round of showers that moved through far southern California during the early morning hours of November 25, 2015 had a regional effect upon California and Arizona. Although measurable rainfall amounts ranged from around one quarter inch near the coast to one third to two thirds an inch in the mountains and valleys no measurable rain fell within the Coachella Valley.[13] As a result, the San Diego NWS office reported reduced visibilities within the Coachella Valley to less than a mile due to blowing dust.

Overall, winds remained westerly during on November 24, 2015 and November 25, 2015, however surface level winds were long enduring from November 24, 2015 through approximately, 1700 PST November 25, 2015, coincident with decreased winds and concentrations at all monitors. **Figure 5-7** is a graphical representation of the meteorological conditions existing November 25, 2015 as westerly winds transported windblown dust into Imperial County on November 25, 2015.

[13] Preliminary Storm Precipitation Totals National Weather Service San Diego; 700 am PST Wednesday, November 25, 2015.

FIGURE 5-7
EXCEEDANCE FACTORS NOVEMBER 25, 2015

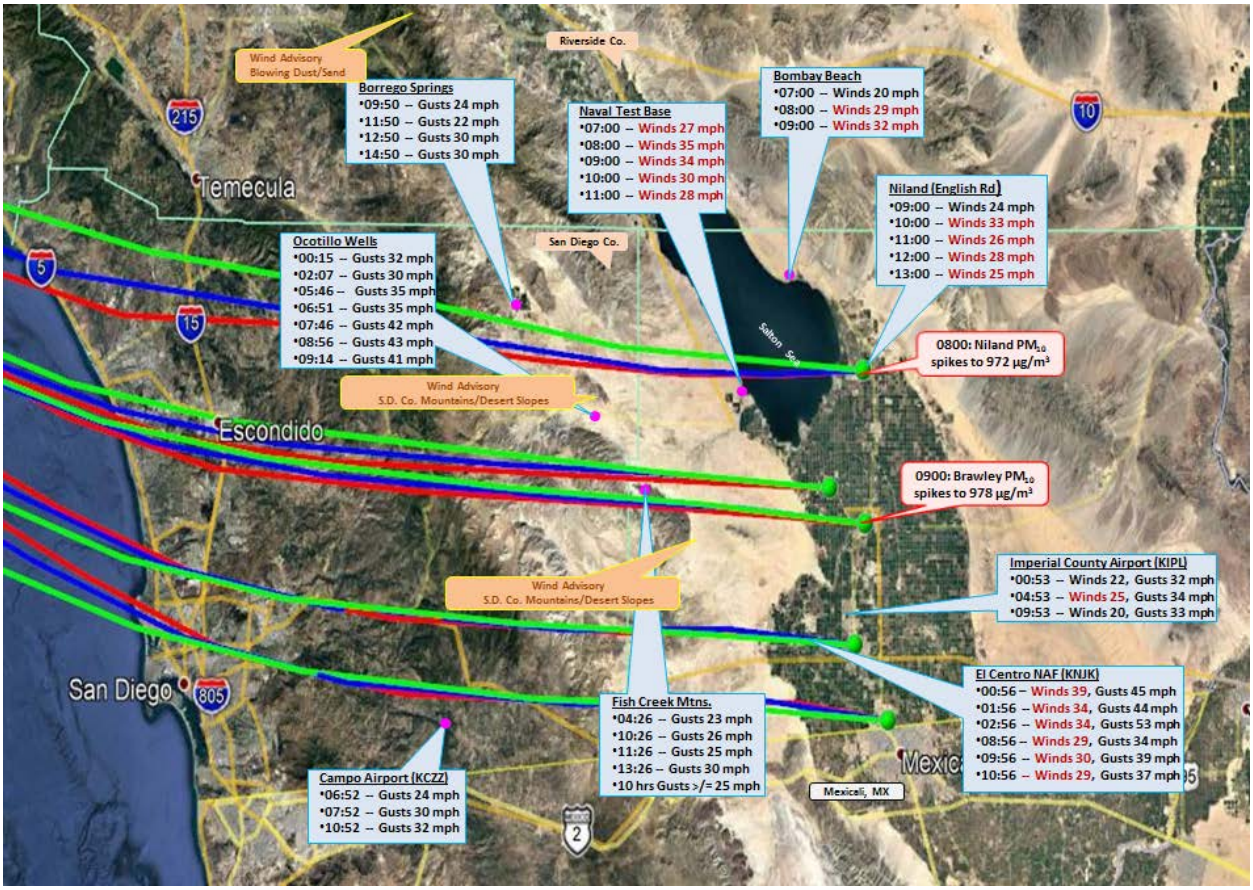


Fig 5-7: The graphical illustration provides information regarding the gusty west winds that blew into Imperial County on November 25, 2015. The use of the hysplit model ending 1700 PST is simply used to illustrate the airflow November 25, 2015. Elevated west winds transported dust into Imperial County over the San Diego Mountains and natural open deserts and through agricultural and urbanized areas west of Niland and Brawley. Red trajectories indicate airflow at 10 meters AGL; blue is 100m; green is 500m. HYSPLIT generated through NOAA's Air Resources Laboratory. Base map from Google Earth.

Figures 5-8 through 5-11 demonstrate the temporal relationship between the gusty winds and the transported windblown dust and resulting effect upon air quality in Imperial County. The positive correlation of measured PM_{10} concentrations at air monitors in Imperial County and specifically at the Brawley and Niland monitors and the elevated wind speeds on November 25, 2015, indicate that as wind speeds increased so did concentrations of PM_{10}. Please note that meteorological sites within the San Diego Mountains, the El Centro NAF (KNLK) and the Imperial County Airport (KIPL) measured wind speeds at or above 25 mph.

FIGURE 5-8
BRAWLEY PM_{10} CONCENTRATIONS AND WIND SPEED CORRELATION

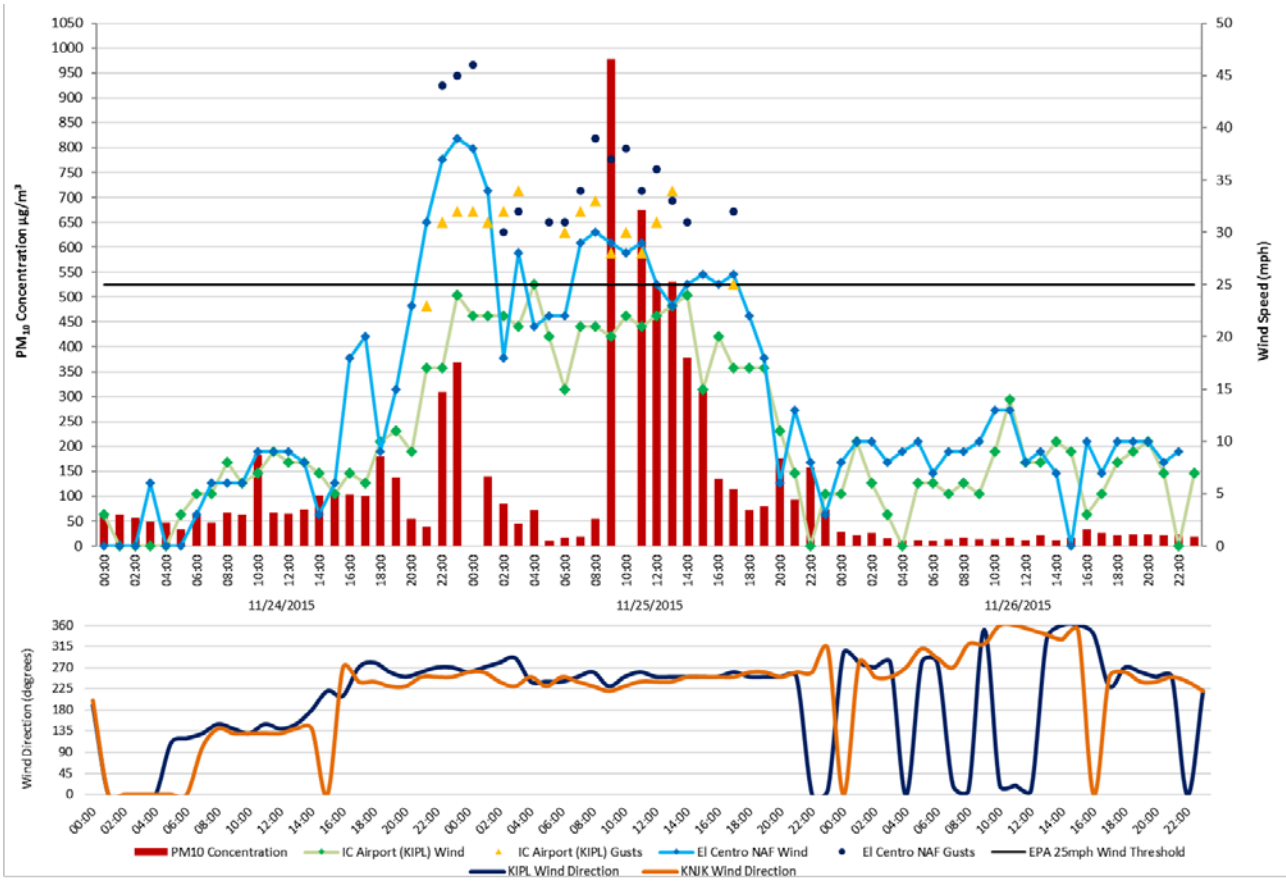


Fig 5-8: Fluctuations in hourly concentrations over 72 hours show a positive correlation with wind speeds, particularly with gusts, at Imperial County Airport (KIPL) and El Centro NAF (KNJKL). Black line indicates 25 mph threshold. Air quality data from the EPA's AQS data bank. Wind data from the NCEI's QCLCD system. All measurements are captured or correlated with PST

FIGURE 5-9
NILAND PM_{10} CONCENTRATIONS AND WIND SPEED CORRELATION

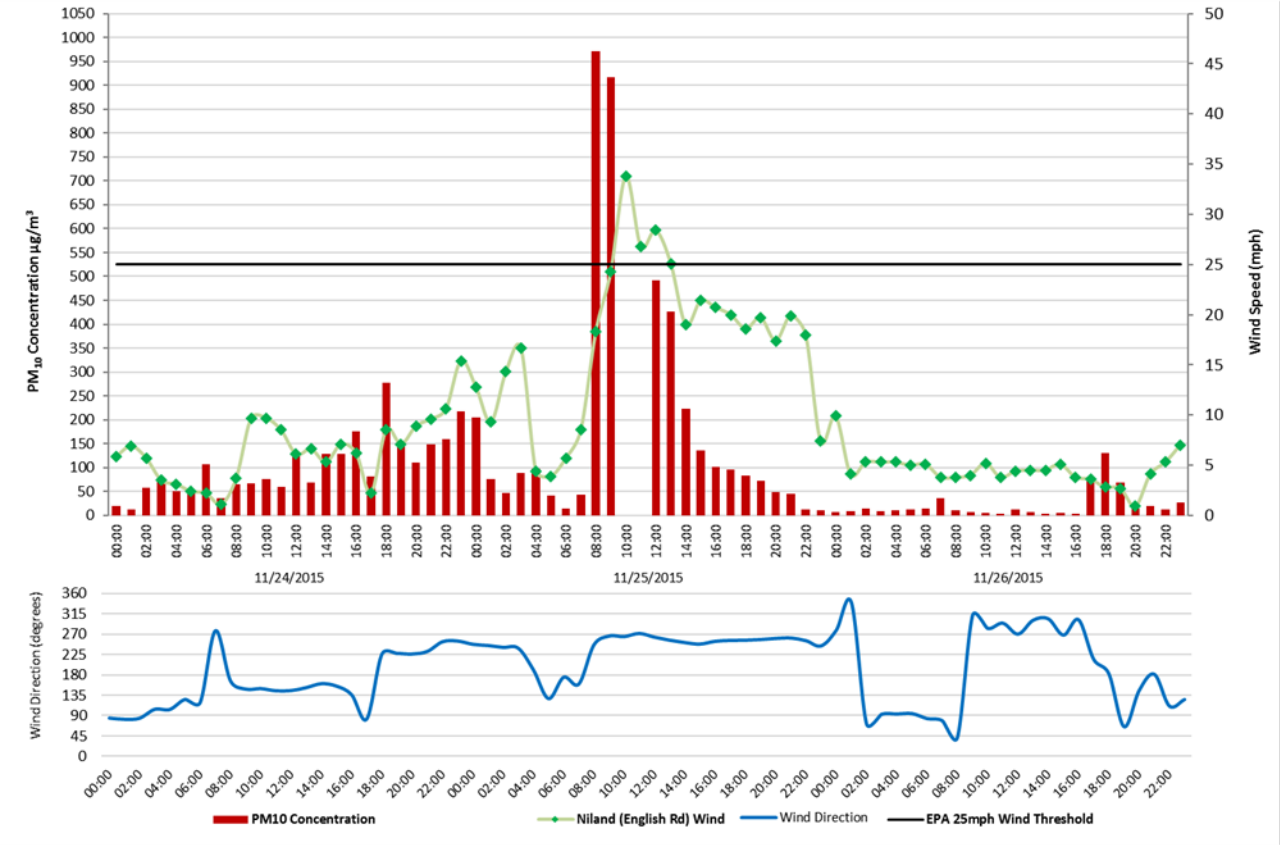


Fig 5-9: Winds at Niland surpassed the 25-mph threshold. Although the station was farther north than Brawley or Westmorland, this allowed the suspended dust to reach the monitor. Black line indicates 25 mph threshold. Air quality and wind data from the EPA's AQS data bank. All measurements are captured or correlated with PST

Figure 5-10 shows hourly concentrations at Brawley and Niland along with wind speeds at upstream wind sites. Increasing gusty west winds during the early morning hours on November 25, 2015 transported windblown dust resulting in elevated concentrations at the Niland and Brawley monitors. There is an evident positive correlation between increases in wind speeds, particularly with gusts, at multiple upstream sites.

FIGURE 5-10
BRAWLEY AND NILAND PM_{10} CONCENTRATIONS AND WIND SPEED CORRELATION

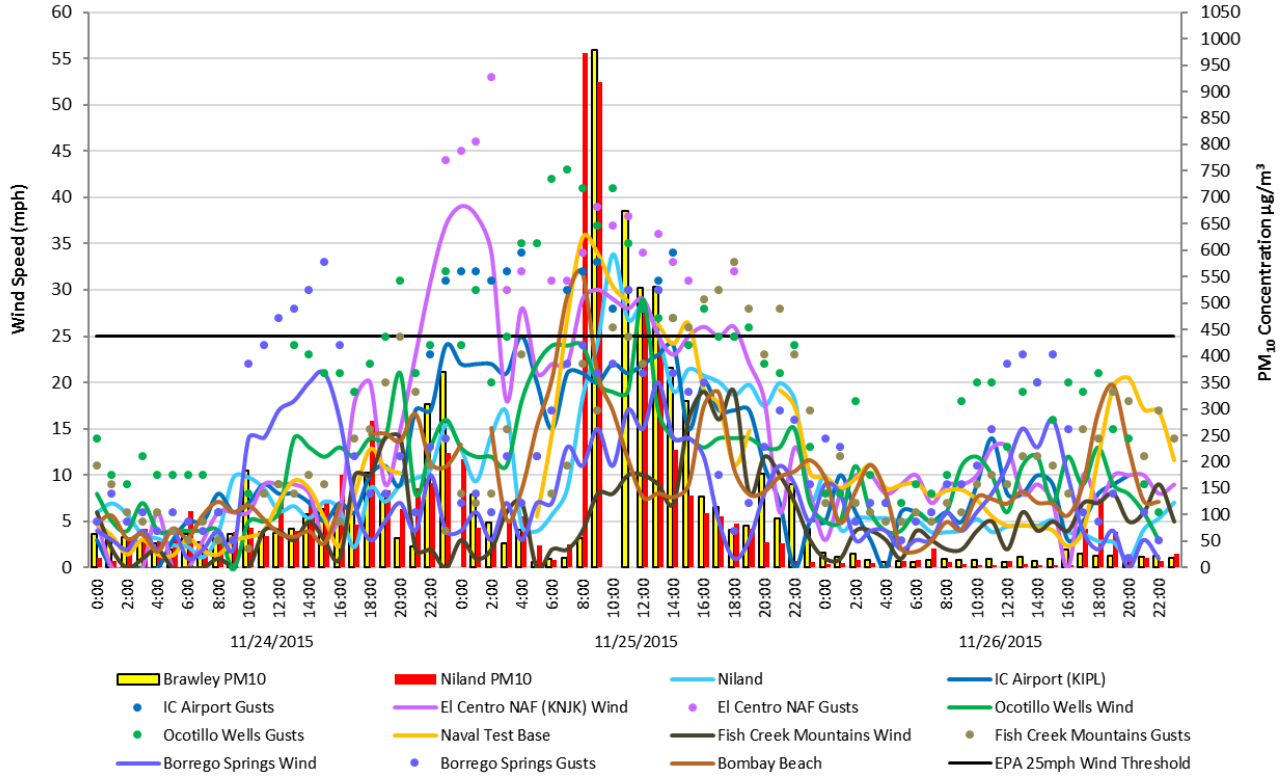


Fig 5-10: Brawley and Niland PM_{10} concentrations show a positive correlation to an increase in wind speeds on November 25, 2015. Elevated wind speeds were above the 25-mph threshold at several locations. All measurements are captured or correlated with PST

Figure 5-11 shows observed visibility at El Centro NAF (KNJK) and Imperial County Airport (KIPL). El Centro NAF saw visibility drop to 1.75 miles between 0054 and 0056 on November 25, 2015. As the dust made its way downstream, Imperial County Airport (KIPL) also saw reduced visibility, although not as extreme, owing to its more northeasterly direction from El Centro NAF (KNJK). This is coincident with elevated concentrations at the Niland and Brawley monitors indicating the presence of dust in the ambient air.

FIGURE 5-11
PM_{10} CONCENTRATIONS AND OBSERVED VISIBILITY AT LOCAL AIRPORTS

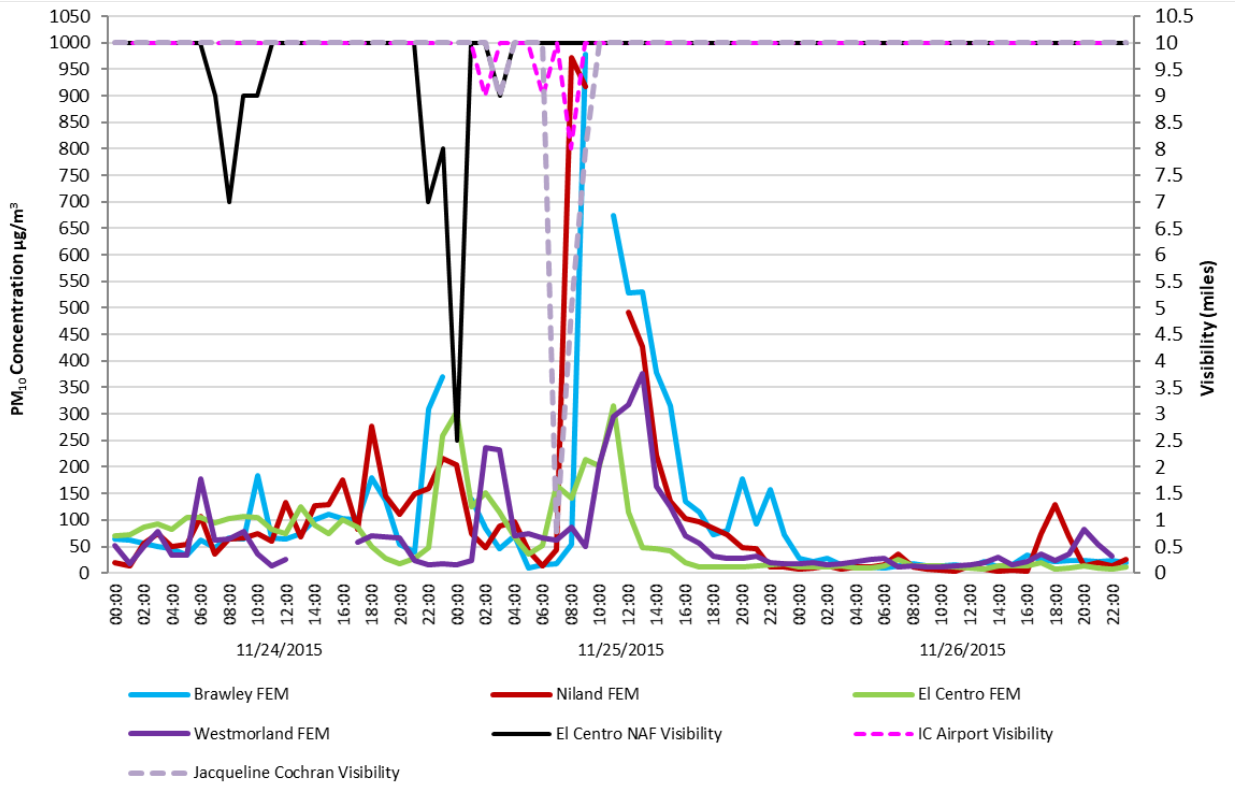


Fig 5-11: Visibility as reported from El Centro NAF (KNLK), Yuma Marine Corps Air Station (MCAS), and the Jacqueline Cochran Regional airport (KTRM) in relation to PM_{10} concentrations

As mentioned above, the cold front and initial round of showers that moved through far southern California during the early morning hours of November 25, 2015 had a regional effect upon California and Arizona. Although measurable rainfall amounts ranged from around one quarter inch near the coast to one third to two thirds an inch in the mountains and valleys no measurable rain fell within the Coachella Valley. As a result, the San Diego NWS office reported reduced visibilities within the Coachella Valley to less than a mile due to blowing dust

The following Air Quality Index (AQI)[14] provides supporting evidence that the transported dust by high winds affected air quality in the Brawley and Niland areas. **Figures 5-10 and 5-11** are the AQI for Niland and Brawley on November 25, 2015. The Yellow or Moderate level indicators are coincident with the moderate level concentrations measured at both the Niland and Brawley

[14] The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health effects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country. Source: https://airnow.gov/index.cfm?action=aqibasics.aqi

monitors. The orange or Unhealthy for Sensitive Groups level is coincident with the elevated concentrations well above 100 µg/m^3. The red or Unhealthy levels are coincident with the measured concentration above 300 µg/m^3. On November 25, 2015 the ICAPCD issued a web-based Air Quality Alert for the Niland and Brawley areas (**see Appendix A**). The resulting air quality indices for Brawley and Niland confirm that windblown dust from the mountains and deserts of San Diego county affected air quality in Imperial County.

FIGURE 5-12
AIR QUALITY INDEX FOR NILAND NOVEMBER 25, 2015

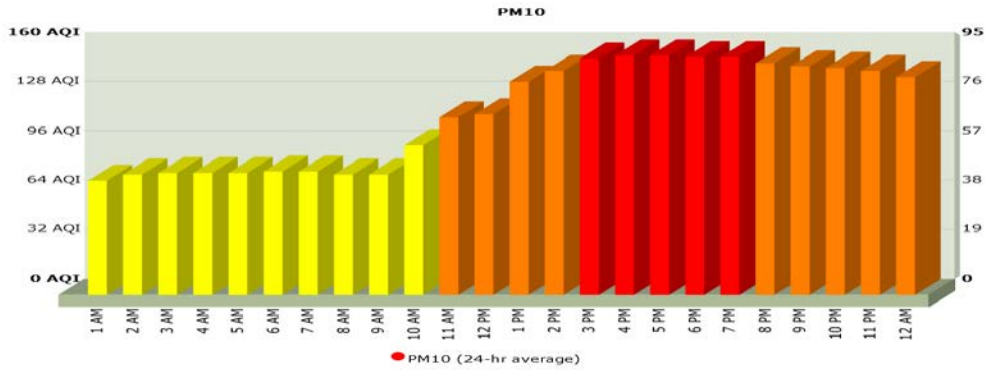


Fig 5-12: Air quality in the Niland area was affected when high winds generated by a low-pressure system transported dust into the Imperial County.

FIGURE 5-13
AIR QUALITY INDEX FOR BRAWLEY NOVEMBER 25, 2015

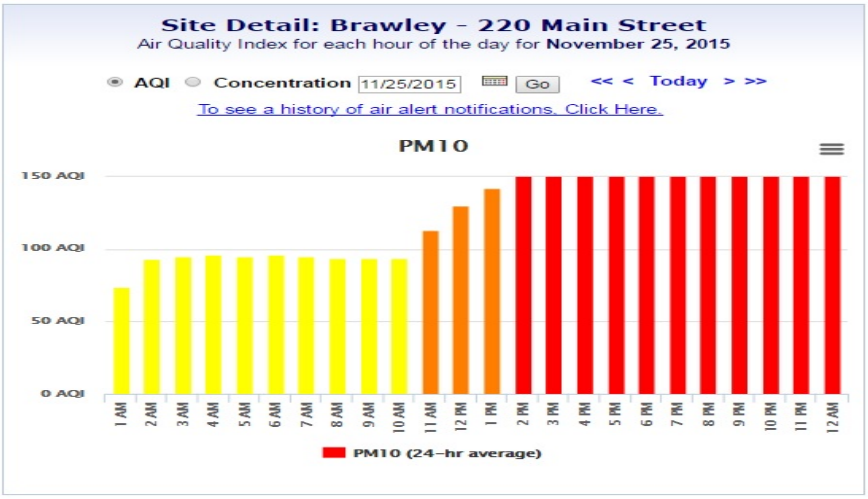


Fig 5-13: Air quality in the Brawley area was affected when high winds generated by a low-pressure system transported dust into the Imperial County.

V.2 Summary

The preceding discussion, graphs, figures, and tables provide wind direction, speed and concentration data illustrating the spatial and temporal effects of the steep pressure gradient accompanying the low-pressure system that passed through the southern region of California. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedance measured at the Brawley and Niland monitors on November 25, 2015. Furthermore, the advisories and air quality index illustrate the affect upon air quality within the region extending from the mountains and desert slopes of San Diego County, all of Imperial County and the southern portion of Riverside County. Large amounts of coarse particles (dust) and PM_{10} transported by strong westerly winds into the lower atmosphere caused a change in the air quality conditions within Imperial County. The entrained windblown dust originated from as far as the mountains and desert slope areas located within San Diego County and Imperial County (part of the Sonoran Desert). Combined, the information demonstrates that the elevated PM_{10} concentrations measured on November 25, 2015 coincided with high wind speeds and that gusty west winds experienced over the southern portion of Riverside County, southeastern San Diego County, all of Imperial County, and parts of Arizona.

FIGURE 5-14
NOVEMBER 25, 2015 EXCEPTIONAL EVENT TAKEAWAY POINTS

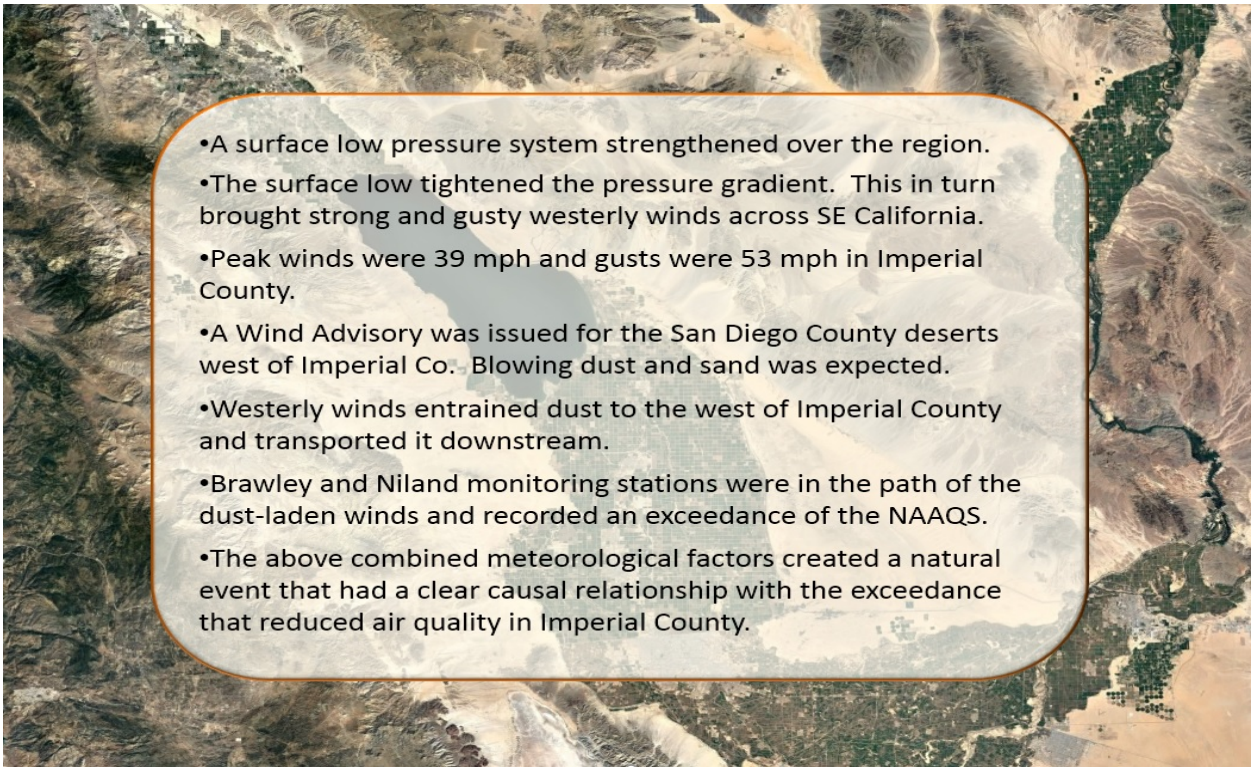


Fig 5-14: Illustrates the factors that qualify the November 25, 2015 natural event which affected air quality as an Exceptional Event

VI Conclusions

The PM_{10} exceedance that occurred on November 25, 2015, satisfies the criteria of the EER, which states that in order to justify the exclusion of air quality monitoring data evidence must be provided for the following elements:

	TABLE 6-1 TECHNICAL ELEMENTS CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})	DOCUMENT SECTION
1	A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s)	5-33
2	A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation	51-67
3	Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of this section	34-42
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	43-50
5	A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event	5-33 & 51-68

VI.1 Affects Air Quality

The preamble to the revised EER states that an event is considered to have affected air quality if it can be demonstrated that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation. Given the information presented in this demonstration, particularly Section V, we can reasonably conclude that there exists a clear causal relationship between the monitored exceedance and the November 25, 2015 event, which changed or affected air quality in Imperial County.

VI.2 Not Reasonably Controllable or Preventable

Section 50.1(j) of 40 CFR Part 50 defines an exceptional event as an event that must be "not reasonably controllable or preventable" (nRCP). The revised preamble explains that the nRCP has two prongs, not reasonably preventable and not reasonably controllable. A natural wind event, which transports dust from natural open deserts, meets the nRCP, when sources are controlled by BACM and when human activity plays little to no direct causal role. This demonstration provides evidence that despite BACM in place within Imperial County, strong

gusty winds overwhelmed all BACM controls where human activity played little to no direct causal role. The PM_{10} exceedance measured at the Brawley and Niland monitors caused by naturally occurring strong gusty westerly winds transported windblown dust into Imperial County and other parts of southern California from areas located within the mountains and deserts of San Diego County. These facts provide strong evidence that the PM_{10} exceedance at Brawley and Niland on November 25, 2015, were not reasonably controllable or preventable.

VI.3 Natural Event

The revised preamble to the EER clarifies that a "Natural Event" (50.1(k) of 40 CFR Part 50) is an event with its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. Anthropogenic sources that are reasonably controlled are considered not to play a direct role in causing emissions. As discussed within this demonstration, the PM_{10} exceedances that occurred at Brawley and Niland on November 25, 2015 were caused by the transport of windblown dust into Imperial County by strong westerly winds associated with the passage of low-pressure system and accompanying cold front that moved through the region. At the time of the event, anthropogenic sources were reasonably controlled with BACM. The event therefore qualifies as a natural event.

VI.4 Clear Causal Relationship

The time series plots of PM_{10} concentrations at Brawley and Niland during different days and the comparative analysis of different monitors in Imperial and Riverside Counties demonstrates a consistency of elevated gusty west winds and concentrations of PM_{10} on November 25, 2015 (Section V). In addition, these time series plots and graphs demonstrate that the high PM_{10} concentrations and the gusty westerly winds were an event that was widespread, regional and not preventable. Arid conditions preceding the event resulted in soils that were particularly susceptible to particulate suspension by the elevated gusty west winds. Days immediately before and after the high wind event PM_{10} concentrations were well below the NAAQS. Overall, the demonstration provides evidence of the strong correlation between the natural event and the entrained fugitive emissions to the exceedances on November 25, 2015.

VI.5 Historical Concentrations

The historical annual and seasonal 24-hr average PM_{10} values measured at the Brawley and Niland monitors were historically unusual compared to a multi-year data set (Section III).

Appendix A: Public Notification that a potential event was occurring (40 CFR §50.14(c)(1)(i))

This section contains wind advisories issued by the National Weather Service and Imperial County on or around November 25, 2015. In addition, this Appendix contains the air quality alert issued by Imperial County advising sensitive receptors of potentially unhealthy conditions in Imperial County resulting from the strong gusty winds. The data show a region-wide increase in wind

speeds and wind gusts coincident with the arrival of dust and high PM_{10} concentrations in Imperial County. In addition, the **Appendix A supplemental** contains all the NWS notices issued by either the San Diego or Phoenix office by date and time order

Appendix B: Meteorological Data

This Appendix contains the time series plots, graphs, wind roses, etc. for selected monitors in Imperial and Riverside counties. These plots, graphs and tables demonstrate the regional impact of the wind event.

Appendix C: Correlated PM_{10} Concentrations and Winds

This Appendix contains the graphs depicting the correlations between PM_{10} Concentrations and elevated wind speeds for selected monitors in Imperial and Riverside Counties. These graphs demonstrate the region wide impact of the wind event.

Appendix D: Regulation VIII – Fugitive Dust Rule

This Appendix contains the compilation of the BACM adopted by the Imperial County Air Pollution Control District and approved by the United States Environmental Protection Agency. A total of seven rules numbered 800 through 806 comprise the set of Regulation VIII Fugitive Dust Rules.